

**Archeological Excavations at
Site 18 FR 320
Catoctin, Maryland**

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PART 2 OF THE CATOCTIN FURNACE
MITIGATION PROJECT 1979-TEAM A

A Report on

Archeological Excavations at
Site 18 FR 320
Catoctin Furnace
Frederick County, Maryland

submitted by

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July 1980

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INTRODUCTION

During the summer of 1979 intensive subsurface investigations were undertaken at a site (18 FR 320) representing the southernmost extent of known iron-working remains at Catoctin Furnace, Maryland (Figure 1). Excavation of the site was made necessary by anticipated impact from the planned dualization of U. S. Route 15, presently forming the site's western boundary. While twentieth century interest in the site is discussed in greater detail in Chapter 2, test excavations by Dr. Kenneth Orr in 1977 revealed clear evidence of historic iron working activity. It thus became necessary to undertake a program of archeological data recovery in an attempt to mitigate the effects of highway construction.

Site 18 FR 320, designated by Orr (1977:8) as "Check 3," is located a short distance north of the intersection of U. S. Route 15 and Maryland Route 806, on the south edge of a large stone and earth dam. Situated near the foot of the east slope of Catoctin Mountain, the site lies on land which apparently once comprised a part of the Auburn estate. Auburn Mansion is visible to the west of the site, across U. S. 15, behind which is an open mine said to have been the first ore mine at Catoctin.

Excavation of the site quickly indicated that subsurface features at the site were far more complex than had been anticipated. As detailed in Chapter 3, this unexpected complexity soon led to a decision to narrow the area initially scheduled for investigation and led as well to a more intensive use of machinery for trenching and stripping. While the 1979 investigation was thus initially conceived as a final mitigation effort, it was soon realized that the extent and complexity of the site would require additional research in order to satisfy project goals. Despite a much appreciated two week extension of the field season, excavation resulted at best in only partial satisfaction of the objectives of the investigation. As of this writing, efforts are being undertaken by the Maryland State Highway Administration to secure necessary funding for a second phase of excavation at site 18 FR 320. The present report, although intended to be as complete a statement as is currently possible, should not be construed as representing a final and definitive interpretive statement.

Research goals defined prior to the start of field investigations included the following:

1. Determination of the exact configuration and location of any remains of industrial structures, if present;
2. Determination of the function of any structural features encountered;
3. Determination of the means of construction of the stone dam and the basin which it encloses;
4. Determination of the specifics of the use of waterpower and, insofar as possible, other technological aspects of iron production at the conjectural foundry and forge.

While the excavations resulted, as noted above, in only partial satisfaction of project goals, they served to define a series of more specific questions and problems (outlined in Chapter 4) which should be included within a research design for additional excavation. Such questions and problems concern particularly attempts to achieve a reasonable interpretation of the historic function of the site - early furnace, remelting furnace ("air furnace") or forge?

SITE HISTORY

While it is not within the scope of this report to present an historical overview of Catoctin Furnace, it is nevertheless important to present a summary of available historical data and the results of various researches thought to be of potential utility in the chronological and functional interpretation of site 18 FR 320. Such data are, however, both sparse and difficult of interpretation. Not surprisingly, the large majority of records relate to Catoctin Furnace operations and ownership during the last half of the nineteenth century, a period during which site 18 FR 320 does not appear to have been active in iron production.

Of the various available reports concerning the history of the furnace area, none contain an exact date for the start of iron working activities at Catoctin. Rather it is generally conceded that a furnace was in operation sometime slightly before or after 1776 (Little and Israel 1971:10; National Heritage Corporation 1975:4), a date based largely upon deed records. A Frederick County deed dated 1803, for example, states that Thomas Johnson paid 100 tons of pig iron on January 3, 1776, for two tracts of land at Catoctin (Little and Israel 1971:16). Pearse (1876:19), however, states that Catoctin Furnace was erected in 1774.

The location of the first furnace at Catoctin is a matter of controversy, stemming in large part from a statement made in 1840 by J. H. Alexander that a new furnace was erected at Catoctin in 1787, "about three-fourths of a mile further up Little Hunting Creek, and nearer the ore banks." This statement, together with the dating of the first furnace to 1774, was repeated by Pearse (1876:19) and by Swank (1884:65). The area encompassing site 18 FR 320 lies, in fact, approximately three-quarters of a mile south of the 1787 stack (although not actually on Little Hunting Creek), and it was hypothesized as early as the 1930's that the site of the original furnace was contained therein.

As part of his researches, W. H. Enslow, supervisory archeologist for the W.P.A., conducted interviews with local residents. As a result of his inquiries, he felt that the site of the first furnace had tentatively been

identified in the area of the earth and stone dam on the north side of what is now site 18 FR 320. As quoted in Orr (1977:78), Enslow reported that:

The site of the establishment of 1774 has been tentatively located on the highway about 3/4 mile south of the present furnace. The owner of part of the probable original site visited the work and corroborated our conclusion by saying that there were ruined walls about two feet below the surface on his truck patch, and that he and his son had removed masses of iron and slag as much as two men could carry, and broken up others with a sledge, selling the iron for junk. The remains in sight from the road indicate the presence of an earth and stone dam of some size, which within the memory of middle-aged residents formed a considerable pond, and discharged its water into a ravine, over which the old Emmittsburg Pike at one time passed on a large brick arch. The old road has been abandoned, and ravine and arch alike have been filled in, in building the new road about 20 feet west. This fill, consisting largely of slag from the dumps of the new furnaces, will considerably complicate determination of the site.

It would appear from the above statement that Enslow had seized particularly upon what is now believed to be the site of an early forge. Although attention was thus focused upon the area east of Auburn Mansion and the Auburn mine some forty-five years ago, no apparent effort was made to test through excavation the supposed furnace location.

Another conjectured location of the original furnace stack has recently been proposed by Orr (1977:77), and is based upon the observations of Mr. William Renner, a long-time Catoctin resident. Subsurface strata and remains similar to those encountered in the 1936 excavation of the existing furnace (in which Mr. Renner participated) were observed by Mr. Renner during construction of a garage some 200 yards north of the stone and earth dam. Subsequent observations have tended to support the hypothesis of early iron working at this location.

In an attempt to follow up the information presented by Mr. Renner, a small test unit was excavated in the reported location by John Milner Associates in the spring of 1980. Excavation of this unit revealed strata which appeared to be quite similar in appearance to those exposed in the excavation of site 18 FR 320, including the presence of slag. Thus, the possibility of an early furnace at this location cannot be discounted.

Fortunately, a small number of records have survived which indicate the types of products being turned out by the furnace prior to the reported reconstruction/relocation of 1787. Documentation indicates, for example, that thirty loads of bombshells were shipped from Catoctin to Baltimore in 1780 (see National Heritage Corporation 1975:5) and a 1776 letter mentions pots, kettles, and dutch ovens on hand at the furnace (Little and Israel 1971:18). The latter reference also expressed the willingness of the owners to attempt the casting of cannon, but an uncertainty of the potential quality.

As a rule, eighteenth and early nineteenth century furnaces produced primarily pig iron for use in the forge. A portion of the molten iron, however, was used directly in the production of utilitarian and marketable implements such as pots, kettles, and stoves. "Nearly all Colonial Furnaces, cast stoves, and 'hollow-ware,' - commonly called pots and kettles" (Committee on Historical Research 1914:8). In its production of such items Catoctin was thus typical of contemporary furnaces such as those in Pennsylvania (Bining 1938:23ff, Walker 1966:153) and New Jersey (Pierce 1957:36, 89, 122). Batsto Furnace, for example, located in the New Jersey pine barrens, advertised in the Pennsylvania Gazette on June 7, 1775, its production of iron pots, kettles, Dutch ovens, skillets, sugar mill gudgeons, grating bars, grist mill rounds, stoves, sash weights, etc. (Pierce 1957:122).

Catoctin Furnace was also typical of contemporary furnaces in the production of salt pans for recovery of salt from sea water. This manufacture apparently resulted from demands for domestic salt production during the period of the Revolutionary War. A recently discovered advertisement in the Maryland Gazette, September 2, 1777, mentions the casting of salt pans at Catoctin:

Salt pans ten feet square and 15 inches deep with screws ready to join and fit them up made at Catoctin Furnace about 10 miles from Frederick Town at 55l per ton. If different (words missing) are defined they will be attempted. Carriage from the furnace to Baltimore is now 7l. per ton. Order left with Messrs. Lux and Bowly will be forward and duly executed.
James Johnson

Iron stoves (or the often decorated plates from which they were made) were in production by 1786, judging by a surviving dated example (National Heritage Corporation 1975:6). It is of comparative interest that at Hopewell Furnace (Berks County, Pennsylvania) stoves were the most important finished product

through the first half of the nineteenth century (Walker 1966:153).

Until at least the 1840's it was apparently common practice to cast finished products directly from the blast furnace. As Swank (1884:65) notes, "on the continent, as well as in England,...various castings were made direct from the furnace, which for this reason was often called a foundry." Pierce (1957:89), moreover, notes that at Martha Furnace (New Jersey) finished cast iron articles were "cast in molds, directly from the molten iron...."

While it was thus normal practice to cast pots, kettles, etc., directly from the furnace, technology also existed for remelting furnaces, termed "air furnaces." According to Bining (1938:37), such furnaces were the forerunners of the cupola furnaces which were common in foundries after the middle of the nineteenth century. Air furnaces were constructed in order to produce finer and more durable castings than could be made directly from a blast furnace. Discussing such refinements, Bining (1938:37) states the following:

While the early furnaces and forges were organized on plantations, most of the other types of ironworks were not. Slitting mills at which was produced slit iron for making nails; plating mills where bar iron was hammered into sheet iron or tin plate iron; steel furnaces where small amounts of blister steel were produced for making tools and air furnaces, the progenitors of modern cupolas, were usually built in towns or boroughs. A few of these, however, could be found on plantations, such as the slitting mill on the Brandywine and the steel furnace at Coventry.

While, like most improvements in the technology of iron manufacture, the origin and evolution of air furnaces is not precisely known, this term appears in English patents early in the eighteenth century (Daff 1972:11ff.). It is not clear, however, whether the term air furnace indicated the same type of remelting furnace as that referred to above.

The existence of air furnaces in America at the time Catoctin Furnace was built does, however, provide an interpretive possibility for site 18 FR 320. That is, the presence of a large number of pieces of cast iron at the site may indicate the earlier existence of a remelting facility for the production of castings, rather than necessarily a blast furnace. This possibility has obvious relevance for the evaluation of speculations concerning the location

of the first Catoctin Furnace.

While there apparently exists no documentation regarding the historic use of site 18 FR 320 for iron manufacture, local oral tradition is strong concerning a nineteenth century forge once located immediately east of the stone and earth dam. The area intensively excavated in 1979, however, was referred to as the "forge field," suggesting that operation of the forge post dates iron casting at site 18 FR 320.

The appearance of site 18 FR 320 within an irregularly bounded area on late nineteenth century deed maps (see figures 2 and 3) suggests some sort of historic improvements, but is probably reflective of the earlier operation of the forge (oral tradition has it that the forge was abandoned at least by the 1880's). An 1858 document referred to as the Bond map indicates an "old forge" east of Auburn House.

In the course of his intensive survey of the Catoctin Furnace area, Orr (1977:8) included within his plans a test excavation of the suspected forge location on the east side of the earth and stone dam. Upon learning that "iron tools" had earlier been discovered on the south side of the dam, test excavations were extended into this area. With the recovery of strong evidence of iron working activity, especially of wedge gates, fragments of cast iron and large quantities of slag, a recommendation was made that this area be subjected to intensive excavation prior to impact from highway construction.

SITE EXCAVATION

A threefold excavation strategy was employed to generate information pertinent to meeting the project objectives previously discussed. The initial investigatory strategy included exploratory backhoe trenches to quickly estimate the location and extent of structural remains on the site. Trenches were also excavated by hand during this portion of fieldwork in areas inaccessible or otherwise unsuited to backhoe use. Careful hand excavation of grid units selected to further expose archeological features discovered in the initial stage comprised the second excavation strategy. Information obtained by the first two strategies indicated the site was much more complex and extensive than originally believed, and that data recovery could be maximized by a final strategy of multiple excavation techniques. Consequently, a backhoe was again employed to mechanically strip a portion of the site, to excavate additional exploratory trenches, and to excavate portions of known features. Hand excavation of grid units continued into the final period to further expose and define previously discovered features. The excavations and observations are described on the Plan of Excavation Units (Figure 4) and Plan of Features (Figure 5), and in the following text.

I. INITIAL EXPLORATORY EXCAVATIONS

After brush was cleared from the main site area (Plate 1), excavation began with an investigation of the dam. A test trench was placed perpendicular to the southeast wall, near its intersection with the southwest wall at the dam's most southerly point. This trench, T-1, was comprised of two parts, each measuring 3 feet wide by 10 feet long. The southern half was cut into the face of the embankment. The northern half was placed on top of the embankment and was separated from the southern half by a balk 3 feet wide (Figure 4). Excavation of the trench revealed a two-part construction of the dam wall. It is comprised of a compacted reddish brown clay berm faced with stone. The facing is of roughly dressed and roughly coursed field stone with some patches of lime and sand mortar. Trench 1 also revealed riprap stones behind the outer stone facing (Plate 2). Artifacts found in the north half, or top of the embankment, included white and gray saltglaze stoneware, and modern bottle glass. The south half of Trench 1, on the face of the embankment, contained nails, modern glass, a horseshoe, and a large slab of

cast iron and slag waste.

In order to quickly explore the site a series of four test trenches were cut by backhoe (Figure 4). The first of these, Trench 2, was placed approximately parallel to the southeast dam wall, between it and Maryland Route 806 (Plate 3). Trench 2 was about 3 feet wide at its southwest end, but had to be widened to over 10 feet at its northeast end due to severe undercutting of the large slag layer. Trench 2 was terminated after about 30 feet, rather than extended along the southeast dam wall past the niche as originally intended. The stratigraphic sequence in Trench 2 includes layers of dark gray-brown humus and yellow sand fill over a thick deposit of slag and cinder fill. The slag encountered is in rough visicular nodules from about 6 inches to 1 foot in diameter and contains large concentrations of fused silica. This type of slag is believed to be a by-product of coke-fired smelting and is thought to be fill material associated with construction of old U. S. Route 15 and Maryland Route 806 (Orr and Orr 1977). Neoteric artifacts, including a Bargs soda bottle, a metal skate, metal bed springs, and other metal objects were found in the slag layer. Hand cleaning of the floor of Trench 2 revealed the base of a rubble stone wall running across the trench near its southwestern end. The rubble wall, designated Feature 2, is approximately perpendicular to the southeast dam wall and is east of the southernmost corner of the dam. The stratigraphic position of the wall is at the surface of a reddish brown crumbly clay with gravel directly beneath the heavy slag layer, 63 inches beneath the surface.

The second exploratory backhoe trench, Trench 3, was placed running northeast to southeast, across the conjectured foundry area. The trench begins near the current U. S. 15 berm ditch and runs southeastward, between the stone entrance pillars to Auburn house for a distance of about 115 feet (Plate 4). As in other test trenches, the backhoe was used to cut only to the surface of the historic charcoal and ash layer. Shovels and trowels were then used to clean the trench's side walls and floor.

A more complex profile was exposed in Trench 3. The yellow sand layer underlying the topsoil is present only in the southeast end of the trench for about 17½ feet northwest of its intersection with Trench 5, and in a thin lens about 2 feet long that begins about 30 feet from the Trench 5 intersection. A dark brown sandy humus layer with rock rubble is directly beneath the

yellow sand or topsoil and overlies a dark yellowish brown sandy clay stratum. Discontinuous lenses of gravel, furnace glass, macadam, and yellow sand with pebbles are between the dark brown humus and dark yellowish brown sandy clay strata. Beneath the sandy clay is a semi-continuous lens of white angular milky quartz gravel. This quartz lens is designated feature 5 and is interpreted as a previous driveway to Auburn house. Under the quartz lens and northwest of it, the dark yellowish brown sandy clay blends into a layer of dark yellowish brown clay mottled with charcoal. The dark yellowish brown clay mottled with charcoal is not present southeast of the quartz lens. Beneath the yellowish brown sandy clay or yellowish brown clay mottled with charcoal strata are discontinuous layers of dark reddish brown crumbly clay and gravel, red clay with charcoal, reddish brown clay, red clay, yellow clay with gravel, and charcoal (Figure 6). A yellow sand with clay floor is also present within the foundation walls of feature 1, to be discussed below.

Several features were exposed in the floor of Trench 3. Two parallel stone foundation walls, about 10½ feet apart and separated by a yellow sand with clay floor, were designated feature 1 (Figure 5). Its stratigraphic position is beneath a reddish brown crumbly clay and gravel layer which underlies yellowish brown clay mottled with charcoal. A black charcoal and slag deposit lies outside both foundations walls. Northwest of feature 1 it underlies the yellowish brown clay mottled with charcoal layer, while southeast of the structure it is beneath the brown sandy soil. A red clay with charcoal layer, stratigraphically equivalent to the charcoal slag layer and reddish brown crumbly clay and gravel layer, is over a portion of the northwestern foundation wall and extends southeastward, over the yellow sand and clay floor, for about 1½ feet. This red clay with charcoal layer also extends northwestward from the feature. Thin lenses of charcoal and ash also occur within the yellow sand with clay floor inside the foundation walls.

The second feature exposed in Trench 3, feature 4, lies about 23 feet northwest of feature 1. It is a single stone foundation wall, more massive than those of feature 1, and is at a slightly oblique angle to them (Figure 5). A brown sand deposit lies directly above the wall, separating it from the layer of yellowish brown clay mottled with charcoal. Northwest of feature 4's foundation wall the brown sand overlies strata of red clay, charcoal and ash, and

yellow clay with gravel. Red clay with charcoal is the basal layer on both sides of feature 4.

Artifacts recovered in Trench 3 include a variety of glass, ceramic, and iron objects. The layer of brown sandy humus contained white clear glaze china sherds, window glass fragments, cut nails, and unidentifiable iron fragments. Redware sherds, window and bottle glass, an iron spike, and an iron strap fragment were found in the layer of reddish brown crumbly clay with gravel overlying the yellow sand and clay floor of feature 1. The charcoal and slag deposit southeast of feature 1 held blue shell edge and redware ceramic sherds, nails, and a wrought iron spike with notches on two opposite sides along its bottom half. Clear green window glass and nails were found in the charcoal and slag layer near feature 1's foundation walls, outside the structure. This layer also contained refined white earthenware, another iron spike, slag, and several unidentifiable iron objects. An 1842 dime was recovered from just above the charcoal and slag deposit southeast of feature 1, at the base of the yellowish brown sandy clay layer. The yellow clay and gravel layer on the northwest side of feature 4 contained refined white earthenware, redware, saltglaze stoneware, and green shell-edge ceramic sherds, bottle and window glass, furnace glass, and slag. Beneath this layer and also northwest of feature 4, the red clay with charcoal layer contained the same inventory of ceramic types with the addition of porcelain sherds. The red clay with charcoal strata northwest of feature 4 also contained considerable evidence of iron casting. A concentration of 6 wedge-shaped mold gates of different sizes was located 6½ feet northwest of feature 4. A handle fragment and a leg or handle fragment from cast iron vessels were also found northwest of feature 4, in the red clay with charcoal layer.

The final two trenches in this initial phase of backhoe exploration were placed crosscutting Trench 3 in the southern portion of the site. Trench 4 extends southwest of Trench 3 for about 43 feet and its continuation to the northeast, Trench 5, extends for almost 30 feet northeast of Trench 3. Layers of overburden are similar to those in Trench 3 and include reddish brown topsoil, yellow sand, dark grey-brown humus and brown sand. In the northeast half of Trench 4 a loosely consolidated layer of large rounded cobbles separates the grey-brown humus and brown sand layers. Feature 5, the quartz gravel deposit interpreted as a previous driveway to Auburn house, and the underlying

yellowish brown clay deposit mottled with charcoal, are present in Trench 5 from 5 to 12 feet northeast of Trench 3.

Hand cleaning of the floor of Trench 4 defined a black charcoal layer in the northeast one-third of the trench. Artifacts recovered from this layer include window glass, nails, wrought iron spikes, a refined white earthenware sherd, slag, furnace glass, and unidentified corroded iron objects. From about 12 feet to 25 feet southwest of Trench 3 the charcoal deposit contained a heavy concentration of slag before being obscured by a test pit from the 1977 intensive survey (Orr and Orr 1977). Hand excavation through this slag and charcoal deposit recovered cast iron waste and penetrated a hard-packed reddish brown clay, gravel, and iron waste deposit overlying a depression of large stone rubble. A stone wall, feature 6, was discovered at the southwest end of this rubble deposit with a possible casting gate and several unidentified, heavily corroded iron artifacts in association. Northeast of the wall a thin gray-green clay layer was exposed beneath the stone rubble and above the hard-packed reddish brown clay with gravel layer. The gray-green clay southwest of the wall contained hollow air pockets and was below the rubble mixed with ash and slag. At this point in the excavations an active flow of subsurface water was intercepted on both sides of the feature 6 wall. Despite daily pumping, water continued to seep into Trench 4 on each side of feature 6 making it difficult to further clean and define stratigraphy.

Shovel cleaning of the floor of Trench 5 penetrated a reddish brown clay stratum underlying the brown sandy soil or yellowish brown clay mottled with charcoal layers, and exposed a deposit of charcoal and ash mixed with red clay. The charcoal, ash, and clay deposit contained numerous small, heavily corroded cast iron fragments, nails, slag, a spike, a brick fragment with the letters "BEI..." over "PR..." impressed on one side, a metal sleeve with attached chain links, and a y-shaped cast iron fragment with a rectangular cross section. A small test cut near the center of Trench 5 exposed a lens of hard-packed rust and slag beneath the charcoal, ash, and clay, and above a similar deposit of charcoal, cinders, and slag. No features were identified in Trench 5.

In addition to the exploratory trenches excavated by backhoe and described above, shovels were used to clear vegetation, duff, and humus in a strip

approximately 1 foot wide along the top of the southwest dam embankment. The purpose of this cover removal was to examine soil on top of the berm for evidence of a head race, flume, culvert, gate, post molds, or other water control and transportation structures leading from the dam basin to features discovered to the south and west. The only anomaly observed in the dark red clay embankment fill was a yellow sand deposit near the northwestern end of the embankment. This area was investigated by a hand-excavated trench, Trench 6-A, 8 feet by 2 feet on a side and about 2 feet deep, placed perpendicular to and across the top of the embankment. The cut exposed an irregular deposit of dark reddish brown clay overlying a red clay lens and underlying the lens of yellow sand. Areas of coarse-grained reddish yellow sand, possibly decomposed brick stains, are present in the dark reddish brown clay deposit (Figure 7). Although brick fragments and a small patch of mortar were present, no patterning was apparent.

II. INTENSIVE HAND EXCAVATIONS

Following the initial exploratory stage of mechanical and hand trench excavation, our strategy shifted to exposing and expanding upon the features discovered. This was accomplished by careful hand excavation of square grid units, 5 feet on a side, and screening of excavated matrices through one-quarter inch mesh hardware cloth (Plate 5). The first two units, N55E30 and N55E35, were selected to further expose the southernmost stone footings of feature 1, previously identified in Trench 3. As in Trench 3, overburden included reddish brown topsoil, yellow sand, dark brown sandy humus with rock rubble and lenses of macadam over dark yellowish brown sandy clay. Feature 5, the angular milky quartz gravel driveway was exposed in both units beneath the yellowish brown sandy clay between 25 and 28 inches below surface. Three parallel grooves from $2\frac{1}{2}$ to $3\frac{1}{2}$ inches wide and about the same distance apart were observed parallel to the northeast edge of the feature, about 6 inches in from it. A single redware sherd with glaze on one surface only was found at the bottom of the feature, on the surface of the dark yellowish brown clay mottled with charcoal stratum. A corner of feature 1's stone and mortar foundation walls was exposed beneath this stratum in unit N55E30 (Figure 8, Plate 6). Inside the structure, north and west of the walls, and surrounding some of the foundation stones, is a yellow sand with clay floor. At the same level exterior to the walls is a deposit of charcoal and ash with slag and numerous artifacts. Although much of the slag is in

scattered bits mixed with the surrounding matrix, it appears to have been deposited against one of the foundation stones in a molten state and then solidified conforming to the shape of the stone. Structural artifacts, including 160 fragments of window glass and 24 cut nails or nail fragments, were recovered from the charcoal, ash, and slag outside the foundation walls. Pearlware and porcelain ceramic sherds, amber bottle glass, a cast iron vessel leg or handle and a possible cast iron vessel body fragment, an unidentified wrought iron object, and a non-ferrous metal object were also found in the charcoal, ash, and slag deposit. Mortar and slag samples were also taken from these two units.

The next series of units excavated was selected to enlarge upon the southern wall and interior of feature 1, and to clear the remnants of units between and truncated by Trenches 3 and 5. Partial units included are N45E30, N45E35, N50E25, N50E30, N50E35, and N55E25. Excavation of the portion of unit N50E25 not included in Trench 3 revealed clear bottle glass, nails, pearlware, redware, and porcelain sherds, and four small, isolated lumps of mortar in the yellowish brown clay deposit underlying the quartz gravel designated feature 5. Beneath this deposit, cut nails, window glass, and cast iron waste fragments were recovered from the layer of reddish brown crumbly clay and gravel. Three small sub-cubical pieces of coal were also found in this layer inside the structure. Removal of the reddish brown crumbly clay layer exposed the foundation stones and yellow sand with clay floor of feature 1. Also in Unit N50E25 a row of stones was found approximately parallel to those of the main foundation wall but set out from it, suggesting the location of steps, a small entrance porch, or other architectural features (Plate 7). Excavation of unit N50E30 recovered a 5 cents coin dated 1890 in association with the quartz gravel designated feature 5. Further excavation exposed foundation stones of feature 1 and the yellow sand with clay deposit in the northwest portion of the unit. To the southeast, exterior to the wall, the unit exposed the black charcoal and slag deposit at the same level. Excavation of the next adjacent unit to the east, N50E35, located pearlware, porcelain, and blue transfer ceramic sherds and unidentified metal objects in the yellowish brown clay mottled with charcoal deposit beneath feature 5. Directly beneath this deposit, at the surface of the reddish brown crumbly clay with gravel stratum, nails, sheet iron, and other iron fragments were found. Additional nails and cast metal objects were found within this

stratum. The portion of unit N55E25 not excavated as Trench 3 was then taken down to further define the interior edge of feature 1's southern foundation wall. The reddish brown crumbly clay with gravel deposit in this unit contained nails, two unidentified cast iron fragments, and pearlware and stoneware ceramic sherds. The most unexpected observation in this unit was thin lenses of charcoal within and overlying the yellow sand with clay floor in the structure's interior.

At this point in the excavations it became apparent that exposure of the historic features could be greatly expedited by mechanical removal of the recent overburden deposits. A backhoe was used to strip the western portion of the site, bounded by Trenches 3 and 4 and the present U. S. Route 15 berm ditch. Although the backhoe was used to remove deposits only to near the bottom of the brown sandy soil layer, it excavated a nearly complete cast iron hollow ware vessel. The vessel has three short legs on the bottom, a tapered handle on one side that slopes slightly downward, and a flared rim. What appears to be a scar from a very narrow wedge-shaped casting gate or a sprue is present on the bottom of the vessel.

Following mechanical stripping of the overburden, attention shifted to the northern foundation wall of feature 1. Unit N60E15 was selected to further define the wall southwest of its initial exposure in Trench 3. Excavation through the yellowish brown clay mottled with charcoal layer recovered furnace and window glass, cut nails, and cast iron fragments. The underlying deposit of reddish brown crumbly clay with gravel contained nails, furnace and window glass, mortar, and a refined white earthenware sherd. The stone and mortar foundation wall was exposed beneath this deposit. On the north side of the wall, presumably exterior to the structure, large tabular pieces of red shale were found overlying a deposit of charcoal, ash, and slag. South of the wall scattered brick fragments and a long flat iron bar with a turned end were found *in situ* on the yellow sand floor. The iron bar extended into the adjacent unit to the south, N55E15. A small piece of coal, as in N50E25, was also found in N60E15.

The next unit to the west, N60E10, was opened to continue following feature 1's northern foundation wall to the southwest. The deposit of red shale first encountered in N60E15 was found to extend into N60E10 north of feature 1's foundation wall. An isolated chunk of mortar, cut nails, window glass, and several heavily encrusted metal fragments including a possible cast iron vessel body

fragment were recovered from the top of the shale deposit. Artifacts found within the deposit of shale include cut nails, window glass, a threaded bolt with a square nut, a small iron bar that tapers near one end, and miscellaneous heavily corroded iron fragments. Three brick fragments and a charred, partly decomposed piece of wood were located at the interface of the red shale and the underlying ash and slag deposit. A large, tabular "puddle" of iron waste, similar to that found in Trench 1, was present in the ash and slag deposit exterior to the foundation wall.

In continuing to expose feature 1, unit N45E25 was opened to further explore the auxiliary footings first observed in unit N50E25, and to expose the deposits immediately exterior to the feature's southern wall. The layer of reddish brown crumbly clay contained furnace, window and bottle glass, nails, and a ceramic inventory including redware, pearlware, blue transfer, and earthenware. Mortar, a small piece of limestone, and a mollusk shell fragment were also found in this stratum. The underlying deposit of charcoal, ash, and slag contained brick fragments, three cast iron sheet fragments, and an unidentified wrought iron object. Slag "nodules" from this area are quite heavy for their size and appear to contain a relatively high proportion of iron.

The next unit to the west, N45E20, exposed the southwestern end of the auxiliary footings and the exterior edge of feature 1's southern wall. Deposits on the floor of the unit at the level of the foundation stones were comprised of a mixture of the black charcoal and ash deposit to the east and the red clay with charcoal deposit to the west. A small, irregularly shaped pocket of loose charcoal was exposed immediately exterior to the foundation stones.

Unit N50E20 exposed more of feature 1's southern wall and interior. In addition to cut nails, bottle glass, unidentified cast iron fragments, and a redware sherd, a clay pipe stem was found in the layer of reddish brown clay and gravel. Beneath this layer, on the surface of the yellow sand with clay floor of feature 1's interior, brick fragments, iron waste, and small slag nodules were found. A cluster of stones was located on the sand floor in the unit's northwestern corner, but no patterning was observed. An elongated strip of dark brown clay extended from one of these stones towards the foundation stones of the feature's southern wall.

The adjacent unit to the north, N55E20, occupies a central position in the interior of feature 1. Excavation through the layer of yellowish brown clay mottled with charcoal to the yellow sand with clay floor exposed two intervening lenses not previously observed. An approximately 1 inch thick layer of dark brown clay was found directly overlying the yellow sand floor and separating it from a lens of dark yellow clayey sand with mortar and brick rubble. A redware ceramic sherd, cut nails, an iron spike, and a metal tool fragment were exposed on the surface of the yellow sand with clay floor. The tool fragment has a round sleeve, presumably to accept a handle, above a thin flat paddle-like blade with at least two round holes through it. The tool fragment is heavily encrusted with corrosion and is too fragile to allow normal cleaning.

With the excavation of feature 1 well underway, it was decided to begin further exploration of the stone foundation wall of feature 4. Unit N80E5 was selected to extend feature 4 southwestward from Trench 3. Soil deposits encountered above the feature wall were complex and unlike those elsewhere on the site. In the southern part of the unit a brown sandy clay with charcoal layer was present from the mechanically stripped surface down to the foundation stones. The northern part of the unit contained in descending order, irregular lenses of hard-packed dark yellowish brown clay mottled with charcoal, dark reddish brown clay with charcoal, dark brown coarse-grained sand, and a small pocket of dark reddish brown clay with charcoal, dark brown coarse-grained sand, and a small pocket of dark reddish brown sandy clay with charcoal over the foundation stones. Artifacts recovered from these deposits include window glass, nails, a wrought iron wedge, and a ceramic inventory of redware, blue shell edge, porcelain, and a thick china rim sherd. Perhaps the most interesting discovery in this unit was a casting wedge gate found *in situ* directly on top of feature 4's foundation stones.

The adjacent unit to the east, N80E0, was opened to continue following the foundation wall of feature 4. Excavation through the uppermost layer in the western portion of the unit, dark yellowish brown sand, exposed an unexpected stone wall, feature 7, running diagonally across the unit from northwest to southeast in a deposit of dark reddish brown clay stratigraphically above feature 4. The wall is from 14 to 16 inches wide and one course, 6 to 8 inches, deep. It is comprised of dry laid, fist-size and larger, roughly

dressed stones or stone spalls. Soil at the level of the top of the wall, on the southwest side, was the familiar yellowish brown clay mottled with charcoal. Stratigraphy northeast of the wall was a complex mixture of irregular deposits. Although these deposits may be lumped into brown sand, reddish brown clay, yellowish clay, or brownish yellow shale categories, a total of 12 different deposits were distinguished by slight variations in color and texture. The hard-packed dark yellowish brown clay, dark reddish brown clay with charcoal, and dark brown sand with charcoal encountered in N80E5 appear to be mirrored in N80E0 although the complexity and irregularity of deposits precludes absolute correlation. In unit N80E0 the stratum of dark brown sand with charcoal contained a clay tobacco pipe stem fragment and overlay a similar deposit of brown sand with charcoal (Figure 9). Black charcoal in the northern two-thirds of the unit and red clay with charcoal in the southern one-third comprised the floor of the unit. The expected foundation stones of feature 4 were not present at this level. Instead, the foundation wall terminates at the western edge of unit N80E5.

The next series of units, N55E5, N55E10, and N55E15, were opened to continue exposing the interior and western wall of feature 1 (Plate 8). In unit N55E15, in the interior of feature 1, a clay pipe stem fragment was recovered from the yellowish brown clay mottled with charcoal stratum. Beneath this layer were the dark yellow clayey sand with mortar and brick rubble lens, and the thin lens of dark brown clay, both first observed in unit N55E20. Underlying these lenses, at the surface of the yellow sand floor, cut nails, a redware sherd with glaze on one side, thin cast iron sheet fragments, and other unidentifiable cast iron fragments, were found. A brick fragment and slag nodules were also present on the sand floor.

Excavation of unit N55E10 recovered a dime dated 1875 from the yellowish brown clay mottled with charcoal layer. Further excavation exposed the northern wall of feature 1 in the unit's northwest corner and the edge of the feature's western wall in the southwest corner of the unit. Numerous smaller stones were present on the sand floor of the structure's interior although no intentional placement or arrangement was apparent.

The adjacent unit to the west, N55E5, exposed the western exterior and cor-

ner of feature 1. Patches of the yellowish sand comprising the interior floor of feature 1 were also found immediately exterior to the foundation wall. Additional deposits of black charcoal and ash, and red clay were exposed exterior to the feature. Excavation in the northeastern part of the unit defined what was expected to be the northwestern corner of feature 1. However, several stones were exposed in the north scarp of the unit, suggesting that the western wall did not terminate at its intersection with the northern wall as expected.

The unit to the north, N60E5, was opened to determine if feature 1's western wall did indeed extend past its presumed northern wall. Excavation through the overlying deposits of dark brown sand and yellowish brown clay mottled with charcoal defined the stone foundation wall extending diagonally across the unit from its northwest to southeast corners. This discovery indicated that feature 1 is a more complex structure than a single room building as previously believed. A black ash and charcoal deposit was found between and on both sides of the foundation stones. West of the foundation, in the presumed exterior of the structure, the charcoal and ash extended for about 1 foot before meeting a lens of red clay near the unit's western edge. East of the wall the charcoal and ash extended for a shorter distance before meeting a heavy deposit of slag.

Contemporaneous with the above investigation of feature 1, unit N30E15 was opened to explore the small stone rubble wall, designated feature 6, north of its first appearance in backhoe Trench 4. The layer of large rounded river cobbles separating the gray-brown humus and brown sand fill layers was found to end in a well-defined line from the unit's southwest to northeast corners. The cobbles did not appear to be laid into place or arranged. They probably were part of the road bed of old U. S. Route 15. Beneath the brown sand, lenses of dark brown clay and dark yellowish brown clay with sub-angular stone rubble were exposed overlying a stratum of hard-packed dark reddish brown clay with gravel and iron waste. This later stratum contained several wrought and cast iron objects, heavily encrusted with corrosion and in some cases, joined by rust. Excavation into this layer defined the stone wall of feature 6 running from Trench 4 to the unit's northwest corner. Additional stone rubble and a solidified "puddle" of iron waste were exposed northeast of the wall.

Investigation of feature 1 continued with the excavation of units N45E15 and N50E15. Feature 1's southern wall was exposed in the northern portion of N45E15. A linear depression about 3 inches wide and 30 inches long was present south of the wall, exterior to the structure. Several cut nails were found in direct association with this depression. The sand floor of feature 1 was exposed in the eastern portion of unit N50E15. The western part of the unit, still in the interior of feature 1, contained dark red clay and charcoal mixed with the yellow sand deposit.

The adjacent units to the west, N45E10 and N50E10 were excavated in sequence in order to expose the southernmost corner and western wall of feature 1. Although the unit was unique in containing no artifacts, N45E10 produced an abundance of unexpected architectural information. The southern wall of feature 1 was found to end from about 3 inches to 1 foot short of the western wall, rather than being joined to it as was expected. Also unexpectedly, the western wall of feature 1 extended beyond its intersection with the feature's southern wall. In addition, the stonework of the western wall was unlike that observed elsewhere. The wall was more narrow and the stones were more compactly laid than at other points along feature 1's foundation walls. A deposit of red clay, charcoal, and slag on the west (exterior) side of the wall was interrupted by a small circular deposit of light brown sand partially bordered by a single stone in the unit's northwestern corner. Excavation of the unit to the north, N50E10, clarified the configuration of walls in unit N45E10. It became apparent the western wall in unit N45E10 was actually a separate wall crosscutting feature 1's western wall at an oblique angle and extending past the southern wall of feature 1. Although the walls are stratigraphically equivalent, their relative arrangement suggests the smaller crosscutting wall predates the remainder of feature 1's western and southern walls. Had the crosscutting wall been constructed after feature 1's foundation walls, it seems unlikely the crosscutting wall would have extended inside the structure rather than butting against it. It seems more likely that *in situ* stones of the crosscutting wall were incorporated into the foundation of feature 1. However, this hypothesis cannot be substantiated without more temporal and functional information about feature 1 and the crosscutting wall.

Unit N35E10 was selected for excavation in an attempt to follow the cross-

cutting wall and to determine its articulation with the wall of feature 6. Excavation of the intervening unit, N40E10, was felt to be less critical at this time and was not undertaken. Overlying deposits in N35E10 included the dark brown clay and dark yellowish brown clay with subangular stone rubble above the layer of dark reddish brown clay with gravel and iron waste as observed in unit N30E15 (Figure 10). The stone wall of feature 6 was found running across the southwestern portion of the unit within the clay, gravel, and iron waste stratum and it appears to be slightly curving towards the west rather than continuing in a straight line from its occurrence in N30E15 and Trench 3. Excavation in the northeastern part of the unit revealed a layer of brown clay with charcoal and a lens of yellowish red clay with charcoal beneath the clay, gravel, and iron waste stratum. The wall crosscutting feature 1 was again found at the same level as the wall of feature 6 and was found to meet it at an oblique angle also. Excavation of the adjacent unit to the south, N25E10, is necessary to determine if the crosscutting wall continues past feature 6, but could not be undertaken in the remaining field time due to the large area requiring excavation to further define other features on the site.

III. CONCLUDING EXCAVATIONS

At this point in the excavations it became evident that multiple excavation techniques were necessary to maximize the amount of information that could be gained in the limited time remaining. Accordingly, it was decided to continue careful shovel and trowel excavation with a minimum of screening, to further mechanically strip the western unexcavated portion of the site, and to excavate additional backhoe trenches. The above strategies were employed simultaneously in the last period of field work but are reported separately in the interest of clarity.

Although a backhoe had been previously used to strip overburden from the western part of the site to within a few inches of the historic strata, it was decided to mechanically strip overburden down to the surface of historic deposits. The purpose of stripping was to quickly explore for evidence of a race or flume, additional walls, or other features. In order to minimize the risk of losing valuable information by using this less meticulous excavation technique

a balk approximately 10 feet north-south by 15 feet east-west was established in which no further stripping would take place. Grid units N55E0, N55W5, N55W10, N60E0, N60W5, and N60W10 comprised the balk. Immediately following the mechanical stripping the north and south faces of the balk were cleaned by hand to define remaining stratigraphy. A stone trough, feature 8, was exposed in the balk's north face. It is formed by two parallel rows of elongated tabular or ovate stones set on end, separated by a floor of smaller, tightly fitting stones (Plate 9). No mortar was observed between any of the stones. The Trough's interior profile is about 10 inches deep and 25 inches wide, although the horizontal dimension is greatly exaggerated because the trough was not cut at right angles. Deposits overlying the trough include a dark reddish brown sandy soil mottled with some red clay, and a thin lens of yellowish brown sandy clay. Immediately overlying and on each side of the trough is a deposit of dark brown sandy humus. A dark reddish brown sand distinct from the uppermost stratum, was found inside the trough. The basal deposit on the west side of the trough and on the stripped floor is the familiar reddish brown clay and carcoal (Figure 11). Although about 40 feet of the trough, from the balk's north face northeastward to units near the western Auburn entrance pillar, were undoubtedly destroyed in the course of mechanical stripping, the loss of data is believed to be negligible for two reasons. One, enough of the feature was left undisturbed to allow determination of its grade and alignment, and secondly, it is believed the destroyed portion of the feature was isolated and had no direct articulation with other features in this area of the site.

Stratigraphy revealed in cleaning the balk's south face was much more complex than that of the north face, and in addition, no evidence of feature 8 was found in the south face. Strata are very irregular with numerous undulating deposits including in descending order, dark brown sandy humus, yellowish brown mottled clay, dark reddish brown clay, dark brown sandy soil, brown sand, yellowish brown sand and dark yellowish brown clay mottled with charcoal (Figure 12).

Followup hand excavation of the south half of unit N60W10, in the west-central portion of the balk, was placed to intercept the stone trough, feature 8, in order to determine its grade and alignment. An edge of feature 8 was found cutting diagonally across the unit's northwest corner at the level of the

dark brown sand stratum (Figure 13). Neoteric artifacts including a rubber and steel tire chain adjuster were found in this stratum. Beneath the level of feature 8, on the red clay floor, a roughly circular arrangement of stones was found near the center of the unit. Five stones resting against each other formed a roughly-shaped cylinder with an inside diameter of about 4 inches. The floor of the stone cylinder was filled with brown sand in contrast to the surrounding deposit of red clay (Plate 10).

Continuing hand excavation included a small test cut through the yellow sand with clay floor of feature 1. The portion of unit N60E15 south and east of feature 1's northern wall was selected for further trowel and screen excavation. The test cut revealed that the stone foundation wall is only one course deep and some sand and mortar are present between the individual stones. The yellow sand floor was only approximately 1 inch thick and contained a redware sherd, nails, mortar, and a large unidentified cast iron fragment. The wall and sand floor were laid on a thin layer of dark reddish brown clay mixed with numerous fist size and smaller nodules of slag. This layer also contained nails with square cross sections. The next layer in descending order was dark red clay mixed with shale and slag, followed by another layer of dark reddish brown clay and slag. The basal layer was dark red clay with charcoal flecks (Figure 14). A single artifact, a wrought iron rod with a pointed tip about 1½ inches long and 1/4 inch in diameter, was recovered in the upper portion of the basal layer.

Additional units in the northwestern part of the site were excavated by hand to further investigate the western wall of feature 1, the stone trough designated feature 8, and the large stone foundation wall of feature 4. Excavation of unit N65E0 exposed the western wall of feature 1 in the eastern portion of the unit. The stones in this portion of the wall are somewhat smaller and more loosely arranged than those observed elsewhere. A deposit of slag nodules was found east of the wall and among some of the foundation stones. A circular arrangement of upright stones, similar to those in the south half of N60W10 and N45E10, was exposed in the unit's western face. It also was filled with brown sand.

Excavation of unit N70E0 was hampered by a stump in the unit's southwest corner and by the western Auburn entrance pillar in the eastern portion of the unit. The western wall of feature 1 is present only in the southeast portion of the

unit. Although it is obscured by the entrance pillar, feature 1's wall appears to turn 90° and to continue under the pillar. Feature 8, the stone trough, was exposed running diagonally across the unit's northwest corner. As in the north face of the balk and in unit N60W10, this portion of feature 8 is comprised of two rows of upright stones separated by a "floor" of smaller stones. This portion was also filled with a brown sand. The two features in this unit were separated by a black charcoal and slag deposit. No direct articulation or connection between the two features was observed.

Continuing to the north, unit N75E0 was opened to further expose feature 8. Feature 7, the small stone spall and rubble wall previously discovered in unit N80E0 was found extending across the northeastern corner of unit N75E0. After being recorded it was removed to allow investigation of underlying features. Feature 8 was exposed in the southeastern corner of the unit. Unlike its trough-shaped configuration elsewhere, the feature in this unit is comprised of a "floor" of larger stones without the rows of upright stones on either side (Plate 11). The upright stones may have been present originally but obliterated by the footing for the Auburn entrance pillar or in the course of mechanical stripping, although no evidence of this was observed. The difference in the size of the "floor" stones in this unit compared to those in the feature to the southwest suggests structural differences in this portion of the feature may also be responsible for the absence of the side stones. In the northeastern part of this unit stones which appear to be related to feature 4 were found. The stones appear to be an extension of feature 4, but do not form a distinct corner or wall.

In the adjacent unit to the east, N75E5, feature 8 continued at the same alignment and also was comprised of larger floor stones without the upright side stones. The feature appears to end abruptly in this unit, without a direct connection to other features. Also in this unit was another circle of stones similar to those previously discussed in units N60W10, N65E0, and N45E10. As in the other units, the circle was filled with brown sand. It is interesting to note the stone circles in units N60W10, N65E0, and N75E5 are in an approximately straight line and have a progressively larger diameter to the northeast.

The final phase of backhoe excavations was designed to explore for additional features and to quickly expose unexcavated portions of previously discovered

features. In both cases it was realized some artifact recovery and provenience control might be compromised by reliance on backhoe excavation. However, it is believed the primary importance of this site is in architectural rather than artifactual information and that the generation of significant data could be maximized through this technique. This does not mean artifacts and their locations were ignored in the final phase of field work, but it does reflect a decision that the remaining time could be most effectively and most efficiently used by expanding our knowledge of the structural configuration of the site.

Trench 6-B was aligned approximately parallel with the southwestern dam embankment, between it and the site area already excavated. It began near the northwestern end of Trench 3 and extended past the southernmost dam corner for a total length of about 69 feet. The purpose of this trench was to intercept water control or transmission features expected between the dam basin and excavated structures. The trench began with an initial swath 5 feet wide to clear vegetation and topsoil. After careful visual examination of the exposed are a second cut $2\frac{1}{2}$ feet wide and penetrating cultural deposits was made along the southern edge of the initial swath, northwest of Trench 7. (Trench 7 was excavated by backhoe between the two phases of Trench 6-B. It will be discussed below). The charcoal deposit southeast of Trench 7 contained numerous fragments of iron waste, some with embedded charcoal and furnace glass. Two wedge gates and a cylindrical riser were also recovered from the charcoal southeast of Trench 7. A u-shaped tool fragment with a hollow sleeve, presumably to accept a handle, was found northwest of Trench 7.

One anomaly observed in the profile of Trench 6-B was a trough-shaped depression cutting through deposits of charcoal and shale. The bottom of the depression was lined with large stone rubble. In order to investigate this anomaly further the eastern half of unit N110W5 was excavated by hand. After penetrating the stratum of reddish brown clay and the underlying lens of charcoal and slag, a layer of stone and brick rubble in dark reddish brown clay and slag was exposed (Figure 15). The stones are loosely consolidated without apparent intentional placement or arrangement. Artifacts associated with the rubble include a hollow ware vessel body fragment and a brick fragment with the letters "...um" over "...ick" impressed. Other bricks and brick fragments had no lettering.

In contrast to previous exploratory backhoe trenches, Trench 7 was designed to excavate a known feature. It was placed to follow the stone wall of feature 4 from Trench 3 northeastward towards the dam. Shovels and trowels were used to clean the feature wall and to prepare the trench scarp for drawing a profile. After following the wall for about 15 feet the trench was interrupted by a large standing dead elm tree. Subsequent to its removal, the trench was continued across Trench 6-B towards the dam. Shovel cleaning revealed that feature 4's wall stops just southwest of the elm stump, turns approximately 90°, and continues northwestward. Another stone wall, designated feature 9, was discovered northeast of the stump. It is slightly oblique to feature 4, and continues from under the stump, northeastward across Trench 6-B for a total length of about 10 feet. Although the southwest end of feature 9 may have been connected to feature 4, the stump prevented observation or definition of their articulation. The northeast end of feature 9 terminated near undisturbed red clay subsoil, near the toe of the dam embankment. The wall is comprised of loosely laid stone rubble two courses deep, and is less substantial than that of feature 4 (Plate 12).

Stratigraphy in Trench 7 between Trench 3 and the stump, over feature 4, included numerous mixed and irregular deposits. Surface deposits included the reddish brown topsoil near Trench 3, a macadam lens, and a layer of very dark grayish brown humus near the stump. The humus layer in the southwestern part of the trench overlay a yellowish brown mottled clay deposit, and in the northeastern portion, butted against a thicker and larger lens of macadam. Beneath the macadam was a deposit of dark yellowish brown sandy clay that graded into brown sand and was interrupted by lenses of milky quartz gravel and yellowish brown mottled clay at Trench 3. Near the stump the yellowish brown mottled clay stratum overlay dark reddish brown sandy clay with gravel, brown sandy clay, charcoal and dark red clay. Lenses of dark red sandy clay with brick fragments were present in the charcoal, the dark red clay, and at the interface of these two strata (Figure 16). Stratigraphy northeast of the stump, over feature 9, included red clay, dark reddish brown clay, and dark red hard-packed clay. A thin deposit of charcoal was present on the surface, at the north end of the trench (Figure 17).

Artifacts recovered from the southwest part of Trench 7, in association with feature 4, include a large slab of waste cast iron, a flat cast iron bar, a

hollow ware vessel fragment, and several unidentifiable iron objects. Artifacts found northeast of the elm stump include by-products of iron casting in the form of wedge casting gates of various sizes, a conical casting sprue and several pieces of iron waste.

Backhoe Trench 8 was placed to expose the remaining portion of feature 1's northern wall, northeastward from Trench 3, and to explore for additional features to the northeast. As expected, the wall of feature 1 was found to continue for about 7 feet beyond Trench 3. No other features were exposed in the trench. Stratigraphy in the trench included the reddish brown topsoil overlying a yellowish brown clay deposit that overlay and abutted against a macadam and gravel road or driveway near Trench 3. To the northwest a dark brown sandy humus deposit was found at about the same level as the macadam. A continuous layer of dark yellowish brown sandy clay was beneath the macadam and dark brown sandy humus. In the northwestern part of the trench it was directly above stratigraphically equivalent deposits of reddish brown clay mottled with charcoal, and a thick deposit of charcoal and slag that extended from the exterior of feature 1's eastern wall. Above the foundation wall of feature 1, near Trench 3, strata beneath the dark yellowish brown sandy clay included the quartz gravel lens designated feature 5, a dark yellowish brown clay mottled with charcoal deposit, and a layer of dark reddish brown clay in descending order (Figure 18). Artifacts found in Trench 8 in association with feature 1 include nails, clear window glass, and a fragment of a cast iron sheet. A clay pipe stem and bowl that fit together were found about 8 inches apart, exterior to the corner of feature 1 at the level of the foundation stones.

An additional wall was expected in Trench 8, perpendicular to the exposed wall and parallel to the wall found in unit N60E5 extending past the southwest end of the exposed wall. Since this expected wall was not evident in Trench 8 an additional trench was excavated by backhoe to explore for the wall or other features. Trench 9 began at Trench 3 adjacent to Trench 8 and extended northeastward for about $7\frac{1}{2}$ feet, to a point in line with feature 1's eastern wall. At this point the trench turned 45° and continued northwestward towards the eastern Auburn pillar and feature 4. Excavation down to the thick charcoal and slag deposit revealed no evidence of the expected wall. A large stone and adjacent smaller stone were exposed at the base of the trench in the profile of the trench's western face, between about 3 feet northwest of the 45° bend and $5\frac{1}{2}$ feet southeast of the Auburn pillar. Although the stones mark

a break in stratigraphy, they are not believed to be a wall of feature 1. No evidence of a wall was found in a corresponding position in Trench 3 nor is there a comparative change in Trench 3's stratigraphy. Additional excavation between Trenches 3 and 9 is necessary to determine the significance of these stones.

Stratigraphy in Trench 9 includes, in descending order, the reddish brown topsoil, a thin lens of yellowish brown clay, the macadam lens and corresponding deposit of dark brown sandy humus with gravel, and a continuous layer of dark yellowish brown sandy clay. Immediately below this latter stratum, feature 5, the quartz driveway, was present southwest of the stones discussed above, and a dark reddish brown sandy clay with gravel was present northwest of the stones. Below feature 5 was a dark yellowish brown clay mottled with charcoal deposit interrupted by a thin lens of dark reddish brown sandy clay with gravel. Beneath this stratum was a deposit of charcoal and slag with a small lens of reddish brown clay with charcoal. Northwest of the stones the dark reddish brown sandy clay with gravel was separated from the basal charcoal and slag by strata of brownish yellow clay and dark red clay (Figure 19). Two wedge casting gates were found in this dark red clay layer near the Auburn pillar. An additional wedge gate, a cylindrical riser, a small cast iron wedge, a spike, and a fragment of cast iron sheet almost 1/2 inch thick were found in the charcoal and slag layer of Trench 9.

ARTIFACT ANALYSIS

It is the purpose of this chapter to: (1) identify the kinds of artifacts discovered at site 18 FR 320, (2) determine the distribution of artifact types on the site, and (3) assess the value of discovered artifacts for dating and interpreting the functions of site features. Each of these goals is approached in a summary fashion, this being a reflection both of the methods employed in site excavation and of the objective of the report to determine specific problems and areas for further investigation.

Not surprisingly, the artifact assemblage discovered at the site is strongly reflective of the industrial function of the site. While a small quantity of ceramics and glass was recovered in the course of excavation, the bulk of the assemblage is comprised of cast iron waste, building hardware, slag and mold gates. A small number of what appear to be tool fragments was also discovered.

CERAMICS

Fragments of ceramics recovered from stratigraphic deposits either contemporaneous with the operation of the ironworking complex or immediately overlying the surviving structural features include four specific types: edge-ware, gray saltglaze stoneware, blue on white Chinese porcelain, and redware. All of the recovered ceramics, irregardless of type, were extremely fragmented, the majority of pieces measuring less than one square centimeter in size. This factor served to hamper accurate identifications.

While clear-glazed redware was perhaps found in the greatest numbers, little is currently known concerning chronological variations in its manufacture. Consequently, the presence of redware fragments in excavated deposits at site 18 FR 320 is of little aid in the determination of an approximate date for industrial operations. Fragmentation of the recovered pieces, likewise, has frustrated attempts to determine the range of vessel types present amongst the redware, although nearly all recovered pieces were glazed on at least one surface.

Relatively small amounts of Chinese porcelain were found, all being of a blue on white variety. Unfortunately, the small size of the recovered fragments

has not allowed a determination of the particular designs employed, a determination which might have aided chronological interpretation. While most pieces appear to represent plate fragments, little more can be said regarding vessel form.

Gray saltglaze stoneware is also of little use for determining site or feature chronology. Again, recovered fragments were extremely small and none revealed evidence of decoration. Gray saltglaze stoneware, as is also true of redware and Chinese porcelain, was in use over a long period of time.

Of the ceramics recovered from stratigraphically early layers, only the decorated fragments of refined white earthenware are of any real utility in dating the site, particularly fragments of blue and green edgeware. The presence of this type of ceramic in excavated deposits is suggestive of an early nineteenth century dating of the industrial operations at site 18 FR 320. South (1972:212), for example gives a mean date for the production of green and blue-edged pearlware of 1805. Fragments recovered at the Catoctin site, however, may include examples of later paste types, and the 1805 date may thus be somewhat early.

COINS

Two dated coins were discovered in the course of the excavations, both in deposits postdating historic industrial activities at the site. The earliest, a dime dated 1842, was found in the vicinity of Feature 1 (rectangular stone foundation and sand floor) but definitely in an overlying stratum (Layer 4). Likewise, an 1890 nickel was recovered in square N50E30 in a deposit immediately beneath a quartz gravel drive which once linked Auburn with old U. S. 15. This coin lay stratigraphically above the northeast corner of feature 1.

While both of the coins discovered at site 18 FR 320 bear specific dates of manufacture, their discovery in deposits overlying feature 1 merely suggests a nineteenth century abandonment of the site.

GLASS

Fragments of glass recovered during the 1979 excavations were divided for purposes of analysis into two general functional groupings: window glass

and bottle glass.

Window Glass:

The distribution of window glass observed in the early deposits at site 18FR320 was such as to have little doubt of its former association with the structure labeled feature 1. Small fragments of aqua-tinted window glass were quite numerous around the periphery of the feature 1 foundation wall, very few of the fragments reaching one square inch in size. More specifically, window glass fragments were discovered in rather large concentrations immediately outside the northeast and southeast walls of feature 1.

Glass fragments recovered appeared of uniform thickness, measuring less than one-sixteenth of an inch. Due to the extreme fragmentation of the artifacts, it was not possible to determine the size of individual window panes.

Bottle Glass:

In comparison with window glass, fragments of bottle glass retrieved from early deposits were exceptionally few in number. As was the case with other non-industrial classes of artifacts, bottle glass was extremely fragmented and, except in very recent deposits, pieces larger than one square centimeter were rare. Moreover, attributes normally employed in dating bottle glass - base, seam, neck, and lip details - were absent in the excavated sample.

At least one excavated fragment appeared to have been part of a wine or ale bottle, being of dark green thick glass. Amber-colored glass was found to be common in the deposits immediately post-dating industrial operations at the site. In sum, however, fragments of bottle glass recovered thus far at site 18 FR 320 are almost totally useless in the dating and interpretation of the site.

NAILS

Almost every excavated unit at site 18-FR-320 yielded a small number of nails, all square in cross section. Due to the extent of corrosion, it was

not possible to determine the method of manufacture for nails recovered in the lowermost deposits. Those found in layers post-dating historic iron working activity, where type of manufacture could be determined, were generally machine cut.

Regarding the distribution of these artifacts, no single unit yielded a large concentration, but nails were present in somewhat larger numbers in the vicinity of feature 1 than elsewhere on the site. Unlike the distribution of window glass, nails appeared to be distributed somewhat uniformly around the periphery of feature 1.

It does not appear that nails were an item of manufacture at this site. Recovered artifacts do not include rolled and slit iron sheets, characteristic of early nail manufacture. Excavations in the early 1950's at Saugus Ironworks (Massachusetts), for example, yielded comb-like pieces of iron from which nails were cut and headed. Nails found at site 18 FR 320, therefore, are interpreted simply as building debris.

WEDGE GATES AND SPRUES (Plates 13 and 14)

Together with fragments of cast iron artifacts, wedge gates and sprues provide the strongest evidence relative to a functional interpretation of historic industrial activities at the site. These items serve as evidence of iron casting through the use of wooden flasks and packed sand.

Flask casting, a technique for the production of cast iron objects first developed in the initial decades of the eighteenth century, involved the use of two or more rectangular wooden frames (flasks) into which sand was packed around a pattern. Removal of the pattern and a conical- or wedge-shaped plug allowed the resulting cavity to be filled with molten iron. While the iron poured into the mold cavity thus became the cast artifact or implement, iron remaining in the mold opening formed a wedge gate or sprue which was subsequently detached from the molded object. A more complete description of the sandflask molding process can be found in John D. Tyler's article (1974) on the history of technological change in domestic iron casting.

In the course of the 1979 excavations at site 18 FR 320, a total of 30 wedge

gates and sprues were recovered. As Plates 13 and 14 illustrate, considerable variation exists in size and form among these artifacts. As an idealized type, wedge gates may be described as elongated rectangular wedges having pronounced flaring along the thickest edge. The flaring is a result of widening of the uppermost portion of the mold opening to facilitate pouring in the molten iron. Sprues, also as an idealized type, are conical in form with, again, pronounced flaring at the widest end.

For purposes of iron casting, the important distinction between wedge gates and sprues concerns the manner in which the molten iron was admitted to the mold. Whereas the conical opening distributed the molten iron through a small central hole, the wedge-shaped opening allowed entry through an elongated slit. Generally speaking, the wedge gate represented a technological refinement over the sprue, especially as it was more easily removed from the casting after cooling (Tyler 1974:153).

Among the items recovered from site 18 FR 320, only four objects were clearly classified as sprues, while 26 are considered wedge gates. Thus, while both techniques were once employed at the site, it appears that a preference existed for the use of the gate. This is in accordance with the observation made by Tyler (1974:153) that American founders preferred the gate while founders in England preferred the sprue.

While it is not known at present whether the size and shape of wedge gates bears any correlation with the size and types of castings produced, an effort was nevertheless made to determine the range of variation present within the recovered sample. As the accompanying graphs illustrate, length of wedge gates illustrated an approximately normal unimodal curve with an average length of ten centimeters. The smallest measurement was four centimeters and the largest 16 centimeters.

An examination of wedge gate height revealed much less variation within the sample examined, height varying only from five to nine centimeters. While forming a unimodal curve in the accompanying graph, it can be readily seen that the curve is significantly skewed. Although the average wedge gate height is seven centimeters, the most frequent measurement is six centimeters.

It would appear that the sand casting process was less tolerant of variation in wedge gate height than of variation in length. Moreover, no correlation was found between the two variables of length and height.

TABLE 1
HISTOGRAM SHOWING RANGE OF VARIATION
IN WEDGE GATE LENGTH

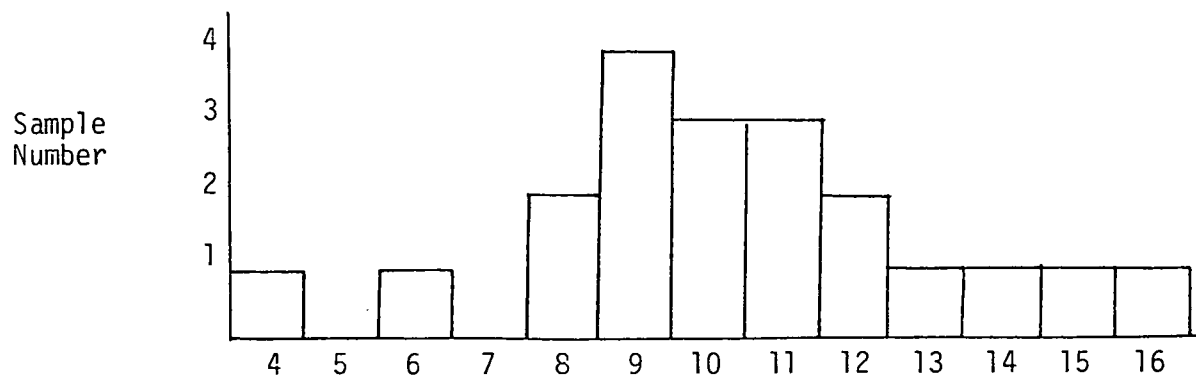
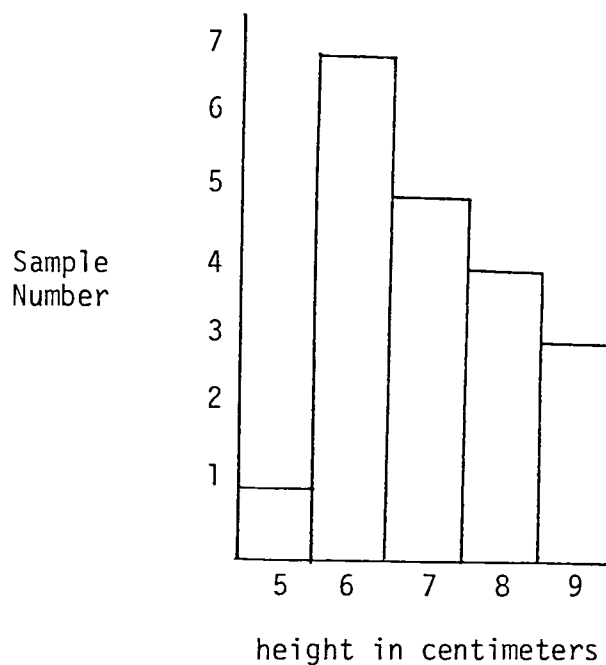


TABLE 2
HISTOGRAM SHOWING RANGE OF VARIATION
IN WEDGE GATE HEIGHT



An initial examination of the distribution of wedge gates and sprues reveals a potentially significant spatial pattern. That is, in relation to recognized features, a strong correlation appears to exist between feature 4 and the presence of wedge gates and sprues. Of the total number of these artifacts recovered during excavation, more than two-thirds were found either within or in close proximity to feature 4. As will be noted in the concluding chapter of this report, the association of feature 4 with wedge gates and its close proximity to the head race underline the importance of further excavation of this portion of the site.

CAST IRON ARTIFACTS (Plates 15 and 16)

In addition to gates and sprues, additional evidence of iron casting was recovered in the form of the cast objects themselves. While only one substantially complete cast iron artifact was discovered (see Plate 15), numerous leg, handle, and body fragments of cast hollow ware were found (Plate 16). Variation present among these fragments suggests that a wide range of sizes was being manufactured. Leg fragments varied in length from two to four inches and were roughly triangular in section. Handles are trapezoidal in cross-section.

A small number of flat cast iron fragments was also discovered in the course of excavation, these artifacts varying in thickness from one-eighth to one-half inch. It was not possible to determine what type of finished product is represented by these items, although it is certainly possible that some are fragments of stove plates.

In marked contrast with gates and sprues, an examination of the distribution of cast iron artifacts shows absolutely no correlation with any feature or portion of the site. Rather, these artifacts are distributed remarkably evenly across the excavated portion of the site.

WROUGHT IRON ARTIFACTS (Plates 17 and 18)

Iron artifacts of wrought manufacture are comparatively rare in the assemblage from 18 FR 320. Generally speaking, such items represent tools and other func-

tional implements which may have been employed at the site. Analysis of these artifacts has not, however, revealed any notable distributional correlation with individual site features.

Three of the wrought iron artifacts recovered appear to have been used either as cold chisels or as prying implements (Plate 17). Each of these artifacts is approximately four inches in length and each tapers to a thin point. Examination of the thicker ends indicates that each may have been snapped.

A heavy wrought iron bar measuring nearly three feet in length was found lying on the sandy floor of feature 1. Rectangular in cross section for most of its length, one end has been rounded and the other is plano-convex. More than likely, this bar represents a piece of machinery, although of unknown function.

Plate 18 illustrates yet another iron artifact of wrought manufacture, this representing an angular hook with a round eye. The precise function of this item is of course unknown.

IRON WASTE AND SLAG (Plate 19)

While not actually representing artifacts, iron waste and slag nevertheless represent byproducts of the manufacture of iron goods and are thus worthy of some consideration. Slag, for example, was nearly ubiquitous across the site, and heavy concentrations were present in Trenches 3 and 4. Due to the presence of such large quantities, only samples of slag were collected. Iron waste, presumably representing molten iron spilled in the process of casting, was also very common across the site.

It should be noted that the slag found at site 18 FR 320 contained fragments of charcoal, testifying to the type of fuel employed in the refinement of the ore or pig iron employed at the site. At least two pieces of slag were found to bear the imprint of a brick lining, possibly from either a blast or remelting furnace (Plate 19).

Regarding the slag found on this site, Heite (quoted in Orr 1977:11) notes

that much of this material is a "frothy mass of iron waste...that forms in foundry sites, but is almost totally absent in a blast furnace." Samples of slag from site 18 FR 320 should be subjected to metallurgical analysis for further interpretation.

ARTIFACT SUMMARY

The purpose of this chapter was stated to be the identification of artifact types, the determination of artifact distributions, and the assessment of usefulness of recovered artifacts for dating and interpreting site features and strata. The extent to which these objectives can be satisfied, based upon the foregoing discussion, can now be explored.

With the realization that the definition of artifact types necessarily involves a certain amount of subjectivity, it is felt that the types outlined in the above discussion represent an adequate and realistic classification of the artifact assemblage from site 18 FR 320. Moreover, the observed distribution of one of these artifact types across the site is of significance in the interpretation of site features.

Examination of the distribution of recovered wedge gates and sprues, as noted earlier, reveals a strong spatial correlation with feature 4, a rather substantial stone foundation wall. The recognition of gates and sprues as by-products of flask casting thus allows at least the formulation of the hypothesis that feature 4 represents at least one locus of activity in the manufacture of cast iron goods at site 18 FR 320. This hypothesis is strengthened by the presence of an earthen headrace nearby.

The ceramic fragments and two coins recovered in the course of excavation are of at least limited value in dating the operation of the site. As was noted earlier, ceramics recovered from soil layers deposited at the time iron working was conducted at the site indicate an early nineteenth century date. While the most common type of decorated ceramic is that of edgeware (both blue and green), eighteenth century ceramic types (delft, white salt-glaze stoneware, and creamware) simply were not encountered. It must be emphasized, however, that the ceramic assemblage was very small and that any conclusions must at this point be considered preliminary.

It is of some interest that an early nineteenth century dating of the site is compatible with the interpretive comments presented by Edward Heite (1980:8). Heite notes that the long raceway apparently leading to site 18 FR 320 could not have predated the second Catoctin blast furnace which stood at its head. In other words, it is unlikely that site 18 FR 320 was in operation prior to the furnace stack which still stands adjacent to Catoctin Hollow Road. This probability leads to the further interpretation that site 18 FR 320 was, as Heite again points out, a foundry or forge and foundry operation rather than a blast furnace. All of this, in perhaps a circular fashion, further underscores the necessity for additional excavation of the site, especially the area encompassing feature 4.

SUMMARY AND REMAINING RESEARCH QUESTIONS

Although much information was gained by the investigations at site 18 FR 320, the four project objectives were only partially satisfied. The site's unexpected extent and complexity, especially the large number of foundation and retaining walls and their unpredictable layout, prevents final interpretation of the site at this time. The completed work has raised a number of specific questions which will require additional excavation for their resolution. Some of these remaining research problems are outlined below.

One of the original research objectives was to determine the location and configuration of any structural remains on the site. The completed excavations were successful in locating numerous structural features, but were of insufficient duration to completely expose all features encountered. Features located but not excavated in their entirety include the stone wall of feature 6, the wall crosscutting features 1 and 6, the northern portion of feature 1, and the stone wall of feature 4. Although the stone trough, feature 8, was not followed to its southwestern terminus, it is unlikely this portion of the feature survived construction excavation of the present U. S. 15 drainage ditch. The stones and stratigraphic break in the western scarp of Trench 9 may also be evidence of a structural feature of unknown configuration.

Information is also required concerning the stratigraphic relationships between excavated features. An observation of the stratigraphy in Trench 3, for example, suggests that feature 1 may post-date feature 4. Attention must therefore be given to vertical excavation as well as to the maximization of feature exposure.

An additional problem related to the location and configuration of structures is the determination of the site's northern and southern boundaries. The western site boundary is defined by the existing U. S. 15 berm and drainage ditch. Although features and other archeological information may have survived construction of U. S. 15, they would be buried by road fill and are not available for archeological investigation in the near future. The eastern site boundary, for purposes of this investigation, is defined by the limit of direct impact from the present dualization project. This limit is

the top of cut or right-of-way as indicated on Figure 4. Although archeological features are known to be extant outside this area they are not expected to be affected by the dualization project and will be preserved *in situ*. In contrast to these two well-defined boundaries the northern and southern site limits are unknown. To the south, feature 6 and possibly the crosscutting wall are known to extend beyond the excavated area. The auxiliary footings at the southeast side of feature 1 raise the possibility that the entrance to this structure faced additional features, possibly other structures or a road or pathway, in the southern unexcavated area. To the north, the dam has previously been assumed to be the limit of structural remains although evidence now available suggests this may not be the case. A backhoe trench cut into the dam embankment by Orr (site 18 FR 331, Trench 7, see Figure 4) revealed a dark humus stratum extending from near the excavated site area underneath the dam fill. Although additional research is necessary, the implication is that the dam postdates the excavated features. Its use as a site boundary is therefore less tenable.

Another of the initial project objectives that requires additional information is determination of the functions of some of the identified structural remains. Features 6 and 9 are believed to be retaining walls because of their location, configuration, and type of construction. The stone walls of features 1 and 4 are believed to be structural foundations although the full configuration of both is still unknown. Although they are undoubtedly associated with iron processing and casting, the specific function of these structures remains to be determined. Additional information in the form of artifacts, features, and stratigraphic correlation is necessary to relate these structures to industrial processes once conducted at the site.

Feature 8, the stone trough (Plate 11), also presents problems in interpretation. Heite (1980:13), for example, feels that this feature represents a portion of the watercourse which once furnished power to the site, possibly a section of tailrace. The fact that the trough is so small, however, has also raised the possibility that it may represent rather some sort of auxiliary drain. In any case, it is essential that an effort be made in the next phase of excavation to determine the relationship between the stone-lined

trough and the head race discovered by Orr.

Knowledge of the location and design of a headrace is critical to interpreting the functions of structures on the site and is essential to meeting the fourth project objective, determination of specific aspects of waterpower and other technological characteristics of the site. Following the close of fieldwork at site 18 FR 320, backhoe Trenches 6 and 8 were excavated by Orr in his investigation of site 18 FR 331, the raceway (Figure 4). Evidence of the headrace was located in these two trenches north of the excavated area of 18 FR 320. Additional excavation and on-site correlation is necessary to follow the headrace towards other features on the site and to further define the site's use of waterpower.

Summarizing his observations of the exposed features, Heite (1980:13) states that the remains in the vicinity of the Auburn gate pillars appear to be part of a water-powered forge with a trip hammer. This observation, together with the recovery of large quantities of cast iron artifacts, raises additional questions. The site, for example, might have been one of diversified ironworking activities (i.e., combination forge and foundry). On the other hand, the cast iron artifacts may have been scrap metal intended for recycling (a possibility noted by Heite). Surviving documentation (see Pearse 1876:20) reveals that the Johnsons were familiar with the process of reclaiming iron from furnace slag. In any case, future excavation should focus upon narrowing the interpretive possibilities. As Heite (1980:9) further states, "without extensive excavation, it is unlikely that a secondary ironworking site can be definitively labelled foundry, forge, or both."

A discussion of problems of interpretation would not be complete without mention of the first furnace controversy as detailed earlier in this report. Although documentation states that the first Catoctin furnace was located about three-quarters of a mile downstream from the location of the surviving stack, it is not thought likely that site 18 FR 320 contains remains of the original furnace. The lack of artifacts definitely of eighteenth century manufacture, together with its relationship to the long raceway, suggest development of the site subsequent to construction of the second Catoctin

furnace in 1887.

Prior to the anticipated second phase of site excavation, further efforts should be made to assemble information regarding the physical configuration of forges, furnaces and, particularly, air furnaces. Such information, some of which has already been examined and referenced in this report, is considered indispensable for interpretation of the site.

In addition to the problems outlined above more chronological information, in the form of time-specific artifacts and intra-site stratigraphic correlation, is necessary to determine if the features identified on the site were in use contemporaneously or if they represent stages in the evolution of the site's physical plant and in the industrial processes pursued. Additional excavation in the northeastern part of the site, for example, may enable determination of the chronological and technological relationships between excavated features, the dam, and the forge site believed to be associated with the niche in the southeastern dam wall. A relative chronology of the features will aid in the interpretation of site 18 FR 320 and its technological change or stability and is also expected to add significantly to an understanding of the development of Maryland's iron industry.

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LIST OF ILLUSTRATIONS

FIGURE

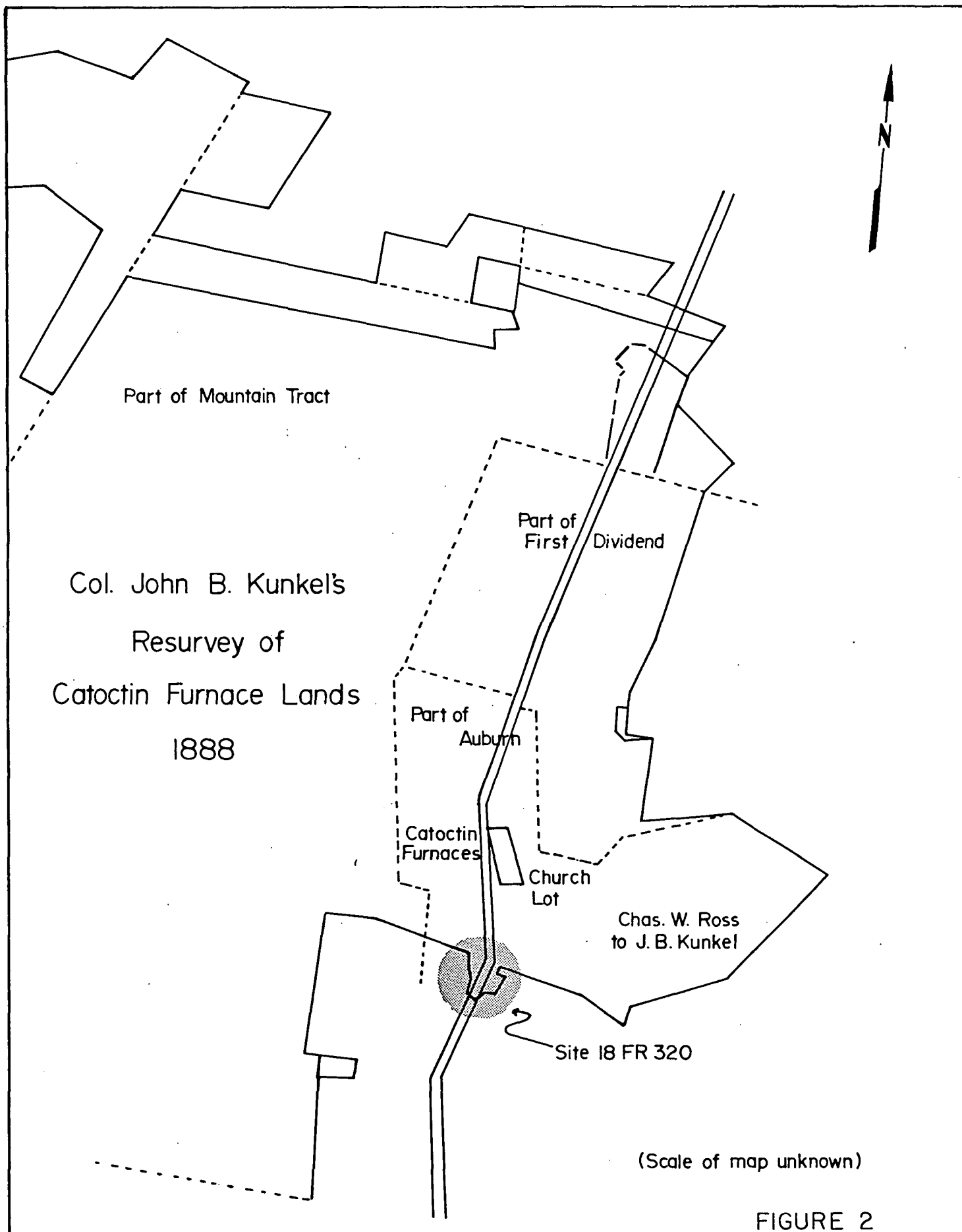
- 1 Location Map
- 2 Deed Map
- 3 Deed Map Detail
- 4 Plan of Excavation Units
- 5 Plan of Features
- 6 Trench 3, Profile Northeast Face
- 7 Trench 6A, Profile East Face
- 8 N55E30-N55E35, Profile South Face
- 9 N80E0, Profile North Face
- 10 N35E10, Profile South Face
- 11 Balk in Mechanically Stripped Area, Profile North Face
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- 13 N60W10, Profile South Face
- 14 Feature 1 Wall, Profile Interior Face
- 15 N110W5 East Half, Profile West Face
- 16 Trench 7 Northeast of Trench 3, Profile Southeast Face
- 17 Trench 7 Northeast of Trench 6B, Profile
- 18 Trench 8, Profile South Face
- 19 Trench 9, Profile West Face

LOCATION MAP
OF
MARYLAND SITE NO. 18 FR 320

0 10 20 30
miles



FIGURE 1



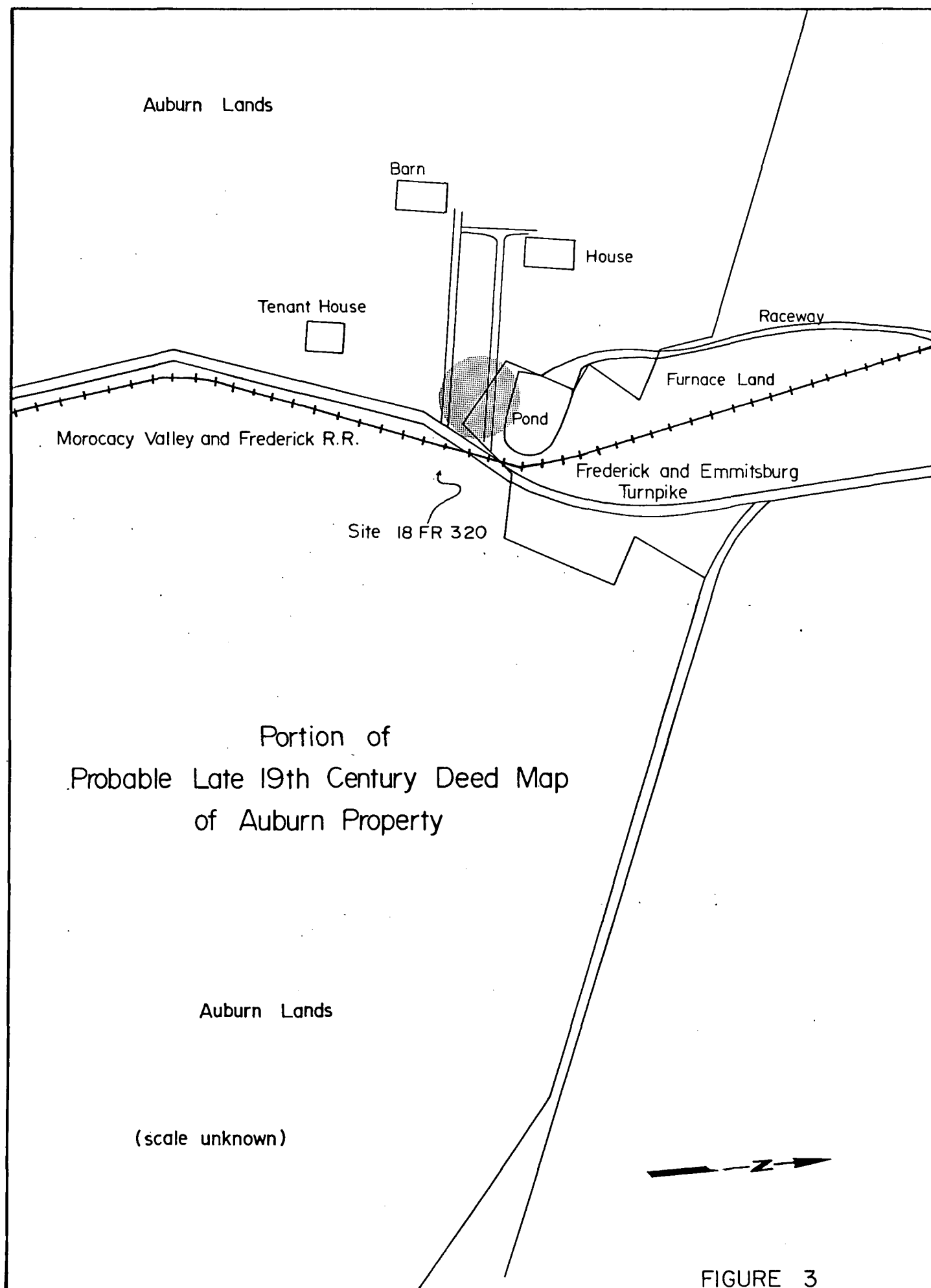
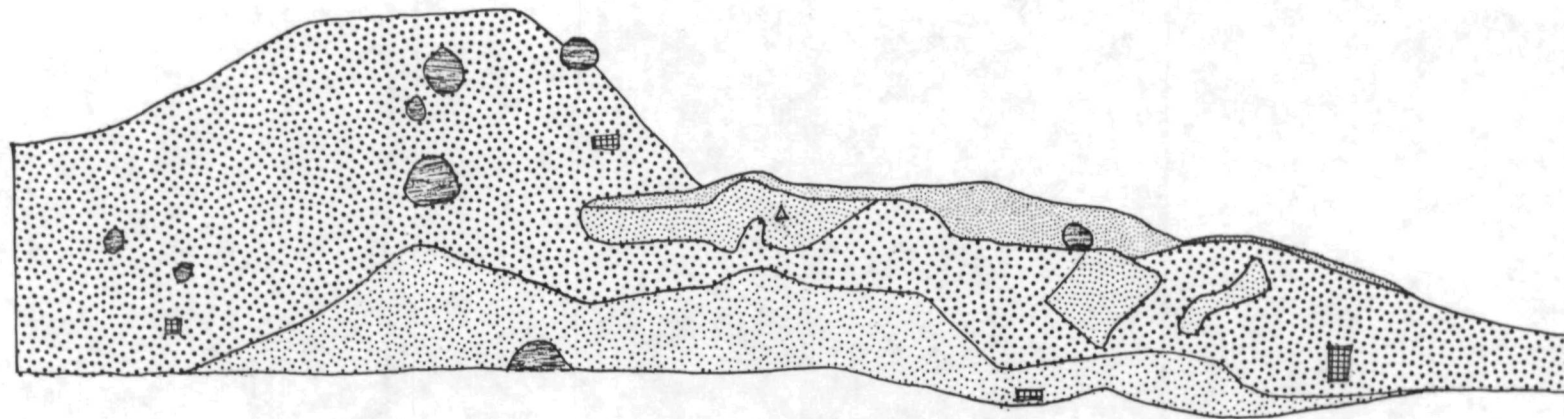









FIGURE 3

TRENCH 6-A PROFILE EAST FACE



LEGEND

	Dark Reddish Brown Clay		Mortar
	Yellow Sand		Root
	Coarse-grained Reddish Yellow Sand		Brick
	Red Clay		

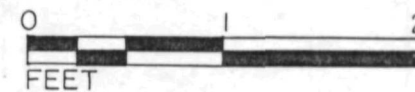
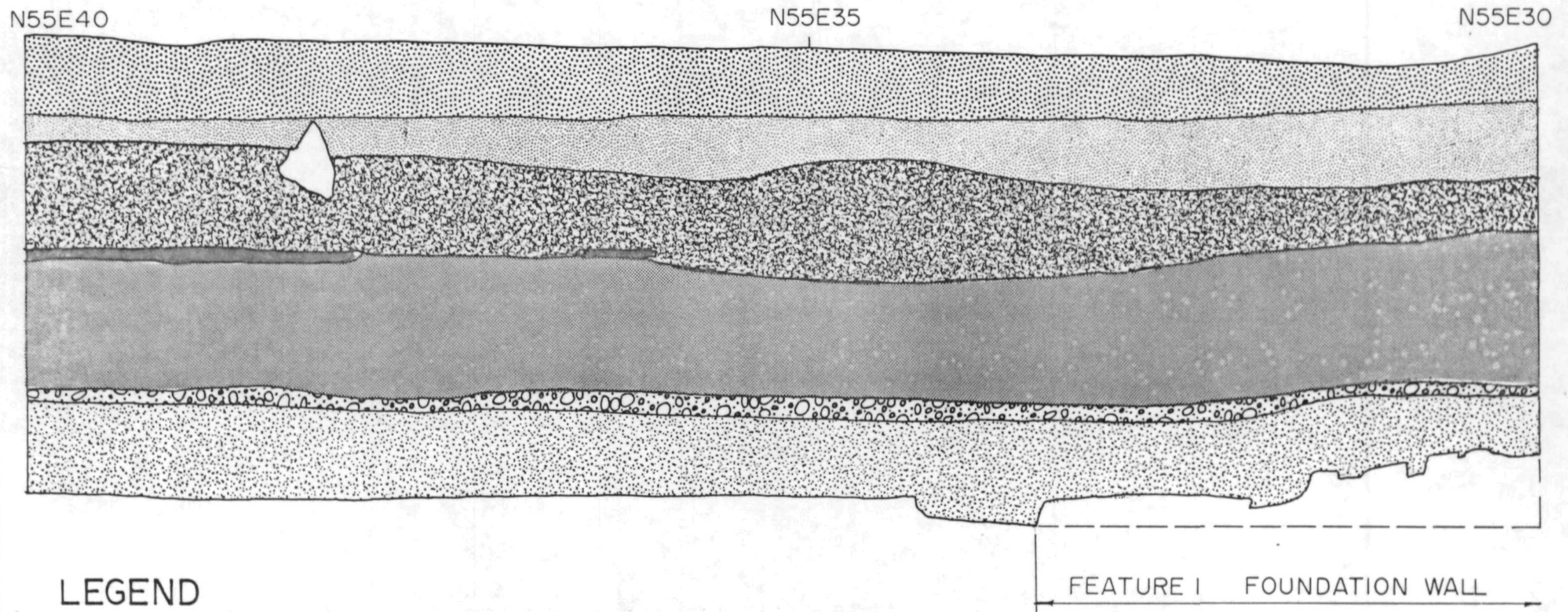










FIGURE 7

N55E30 - N55E35 PROFILE SOUTH FACE



LEGEND

- | | | | |
|---|---------------------------------|---|---|
|  | Reddish Brown Topsoil |  | Milky Quartz Gravel |
|  | Yellow Sand |  | Dark Yellowish Brown Clay Mottled with Charcoal |
|  | Dark Brown Sandy Humus |  | Stone |
|  | Dark Yellowish Brown Sandy Clay |  | Macadam |

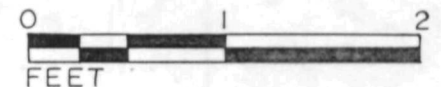
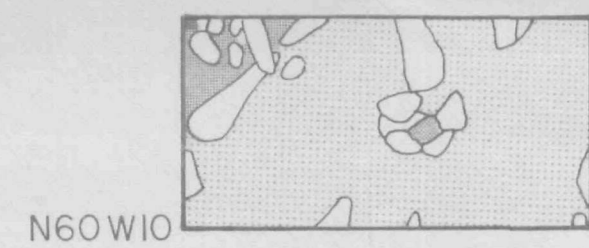


FIGURE 8



LEGEND

- BROWN SAND
- YELLOW SAND WITH CLAY
- CHARCOAL
- CHARCOAL & SLAG
- RED CLAY WITH CHARCOAL FLECKS
- RED CLAY
- SLAG
- RED CLAY WITH CHARCOAL & SLAG
- DARK BROWN CLAY
- HARD PACKED REDDISH BROWN CLAY WITH GRAVEL AND IRON WASTE
- STONE
- DISTURBED

N35E10

N45E10

N55E5

N65E0

N85E0

T-4

T-3

N60E40

T-5

T-8

T-9

T-7

T-3

T-6B

PILLAR

PILLAR FOOTING

PILLAR

STUMP

STUMP

PLAN OF FEATURES

18 FR 320

CATOCTIN, MARYLAND

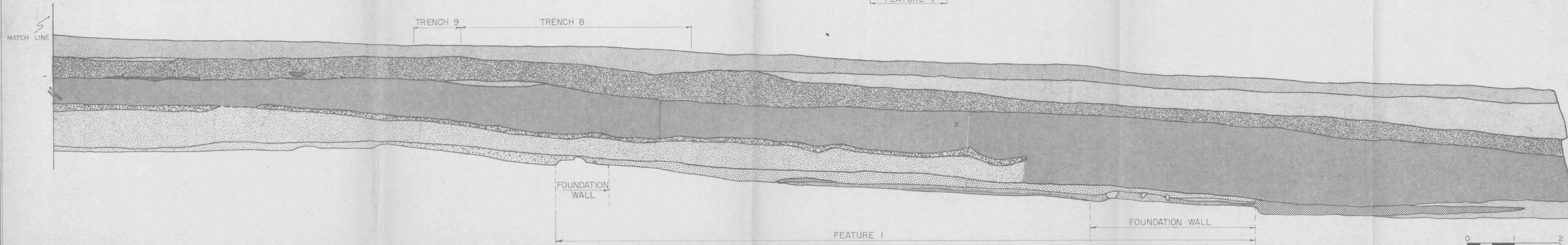
0 1 2 3 4 5 10 FT.



TRENCH 3 PROFILE NORTHEAST FACE

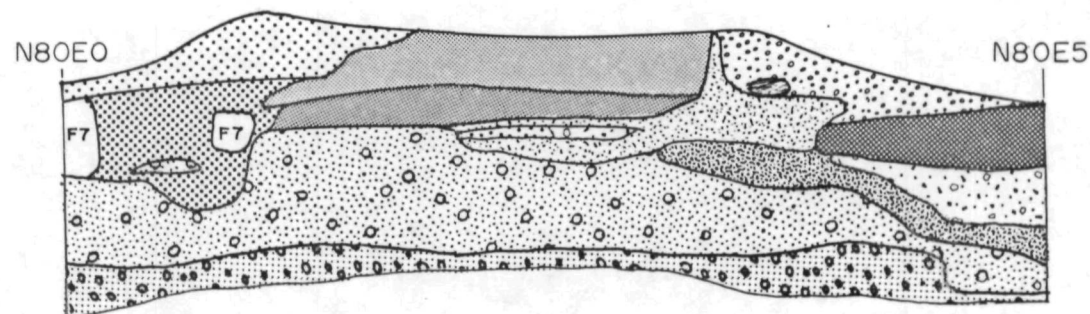
LEGEND

	Reddish Brown Topsoil		Milky Quartz Gravel		Yellow Sand with Clay		Gravel		Brown Sand
	Yellow Sand		Dark Yellowish Brown Clay Mottled with Charcoal		Red Clay		Yellow Clay with Gravel		
	Dark Brown Sandy Humus		Charcoal		Stone		Red Clay with Charcoal		
	Yellow Sand with Pebbles		Dark Reddish Brown Clay		Charcoal and Slag		Macadam		
	Dark Yellowish Brown Sandy Clay		Reddish Brown Clay				Furnace Glass		

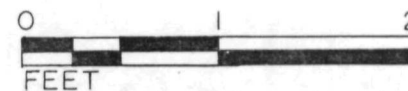


0 1 2
FEET
FIGURE 6

N80EO PROFILE NORTH. FACE



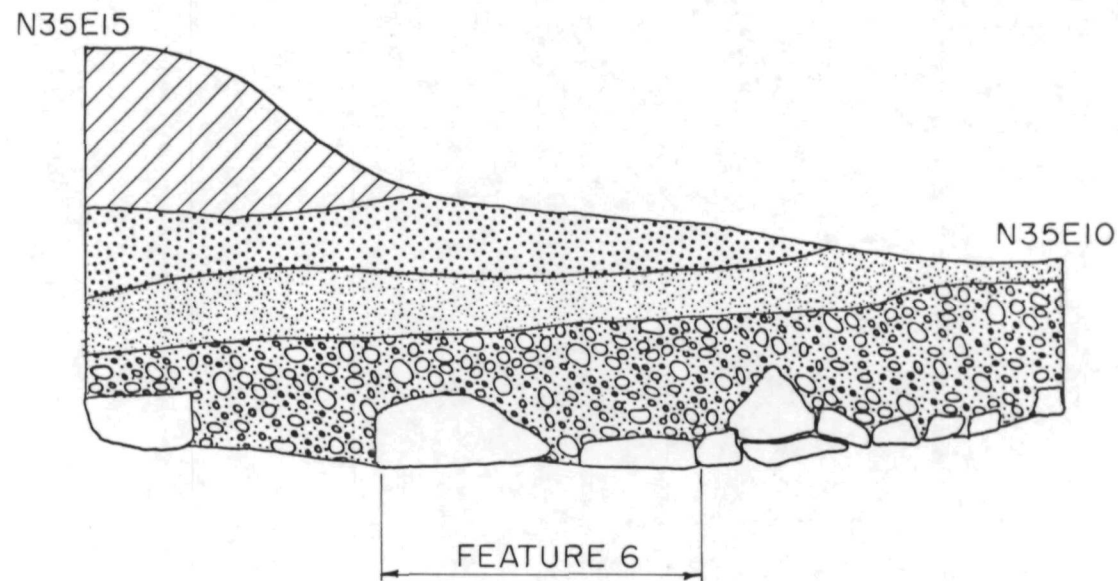
LEGEND








- | | | |
|--|---|-------------------------------|
| Dark Yellowish Brown Sand | Dark Yellowish Brown Clay Mottled with Charcoal | Dark Brown Sand with Charcoal |
| Dark Yellowish Brown Medium-grained Sand | Dark Reddish Brown Clay | Brown Sand with Charcoal |
| Dark Brown Coarse-grained Sand | Dark-Reddish Brown Clay with Charcoal | Stones in Feature 7 |
| Very Dark Greyish Brown Sand | Hard-packed Dark Yellowish Brown Mottled Clay | Root |
| Dark Yellowish Brown Fine-grained Sand | Brownish Yellow Shale | |

FIGURE 9

N35E10 PROFILE SOUTH FACE



LEGEND

- | | |
|--|---|
|  Dark Brown Clay |  Stone |
|  Dark Yellowish Brown Clay with Stone Rubble |  Disturbed |
|  Dark Reddish Brown Clay with Gravel and Iron Waste | |

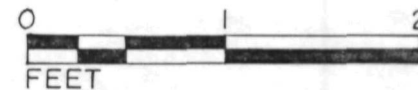
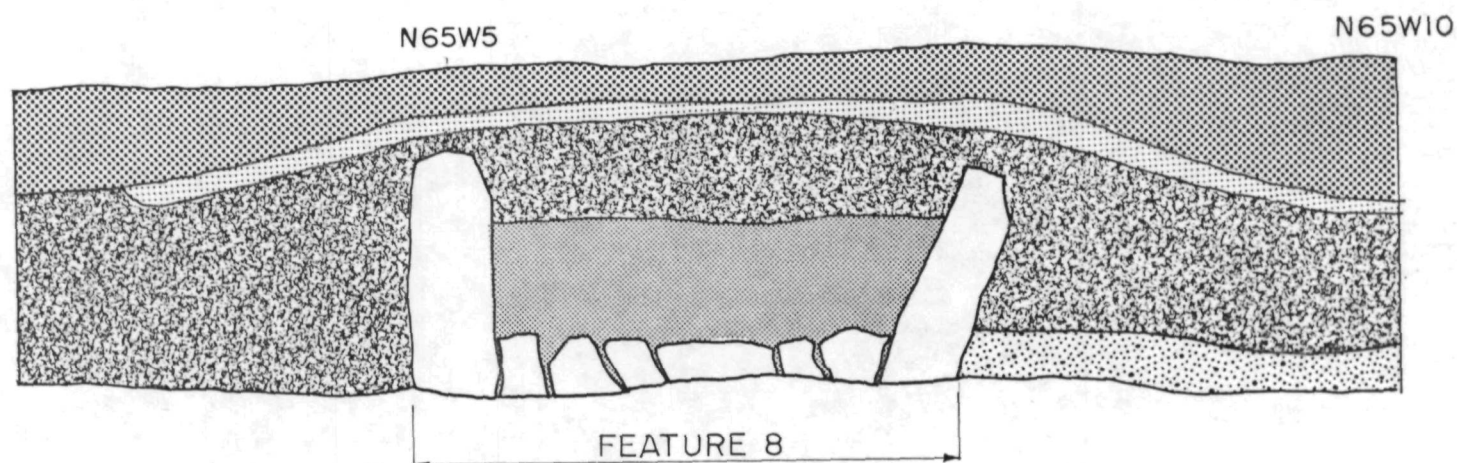




FIGURE 10


BALK IN MECHANICALLY STRIPPED AREA PROFILE NORTH FACE





LEGEND

 Dark Reddish Brown Sand Mottled With Red Clay

 Yellowish Brown Sandy Clay

 Dark Brown Sandy Humus

 Dark Reddish Brown Sand

 Reddish Brown Clay with Charcoal


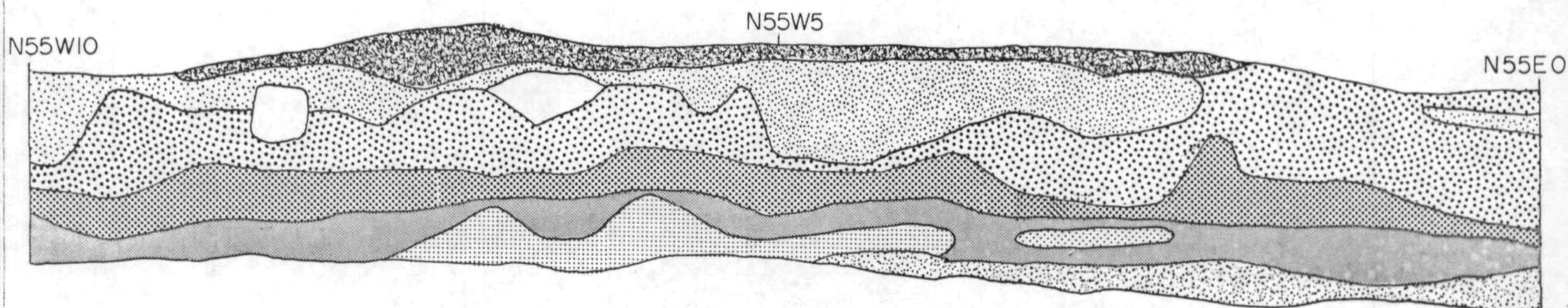
 Stone



FIGURE 11

BALK IN MECHANICALLY STRIPPED AREA PROFILE SOUTH FACE



LEGEND









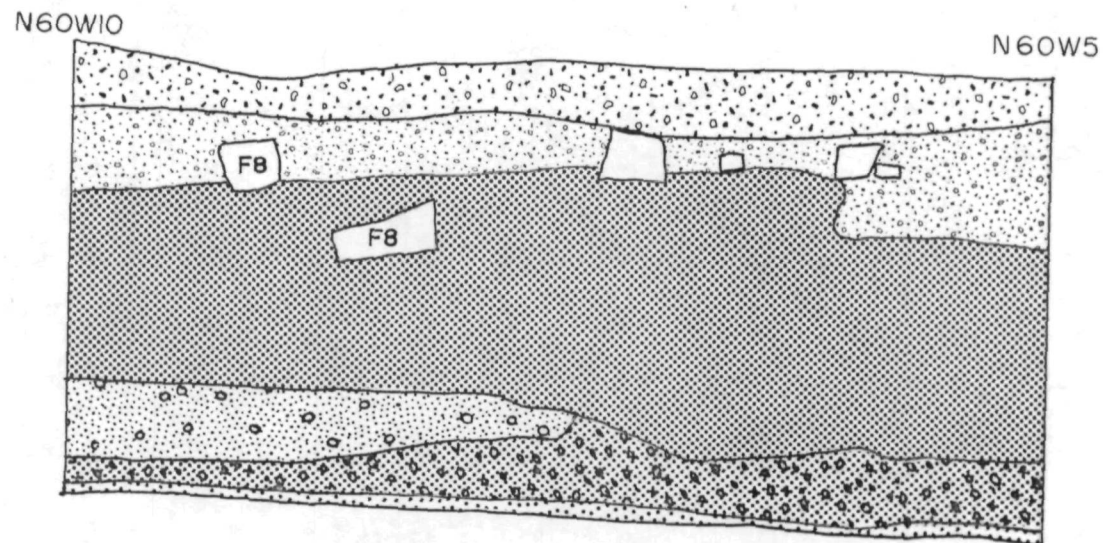
- | | |
|--|---|
|  Dark Brown Sandy Humus |  Brown Sand |
|  Yellowish Brown Mottled Clay |  Yellowish Brown Sand |
|  Dark Reddish Brown Clay |  Dark Yellowish Brown Clay Mottled with Charcoal |
|  Dark Brown Sand |  Stone |



FIGURE 12

N60W10 SOUTH HALF PROFILE NORTH FACE



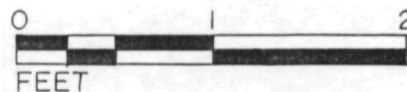
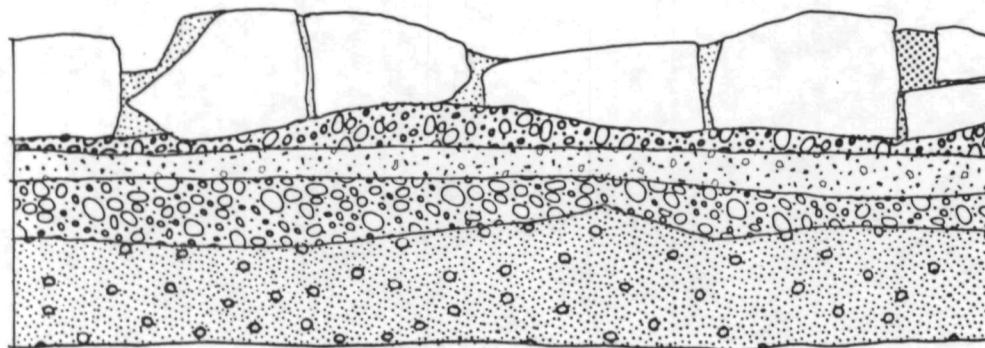
LEGEND

- | | |
|---|--|
| Brown Sand With Brick Fragments and Charcoal | Dark Brown Sand With Charcoal and Slag |
| Yellowish Brown Sandy Clay with Brick Fragments | Dark Reddish Brown Clay |
| Dark Brown Sand | Stone |
| Dark Reddish Brown Sand with Gravel | Stones in Feature 8 |









FIGURE 13

FEATURE I WALL PROFILE INTERIOR FACE



LEGEND

-  Yellow Sand with Clay
-  Mortar
-  Stone

-  Dark Reddish Brown Clay and Slag
-  Dark Red Clay with Shale and Slag
-  Dark Red Clay with Charcoal

KEY PLAN

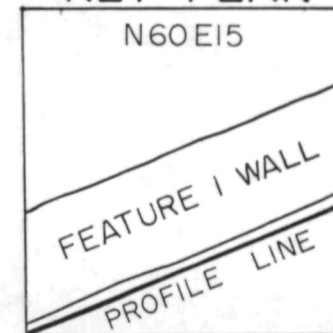
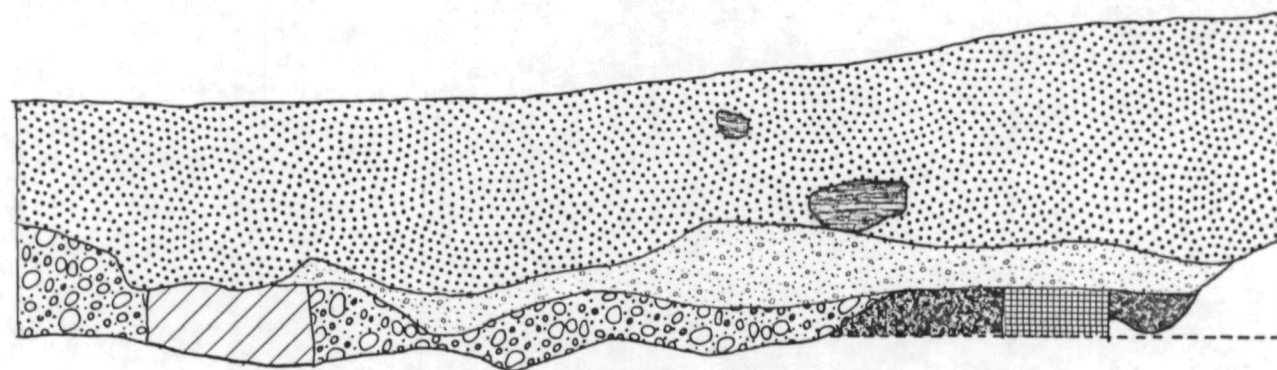










FIGURE 14

N11OW5 EAST HALF PROFILE WEST FACE



TRENCH 6-B

LEGEND

- | | |
|--|--|
|  Reddish Brown Clay |  Dark Red Shale |
|  Charcoal and Slag |  Brick |
|  Dark Reddish Brown Clay and Slag |  Stone |
|  Root |  Unexcavated Balk |

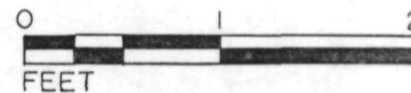
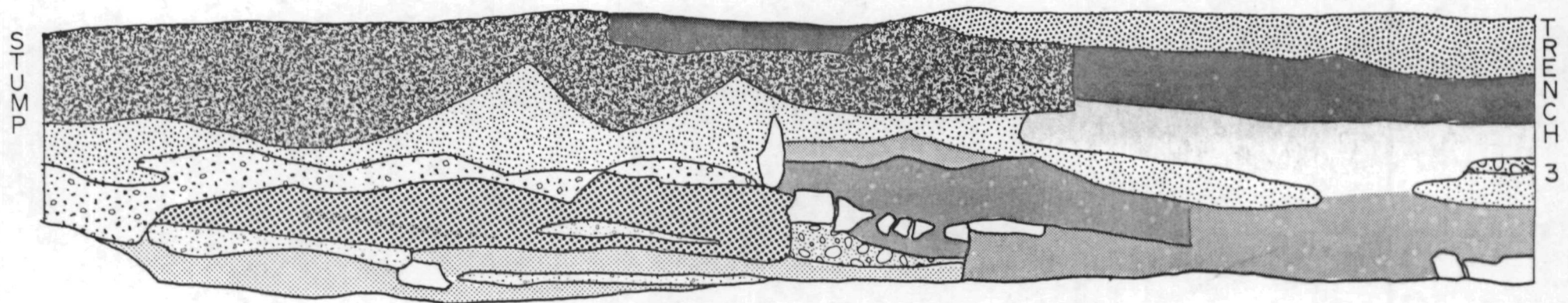


FIGURE 15

TRENCH 7, NORTHEAST OF TRENCH 3 PROFILE SOUTHEAST FACE



LEGEND

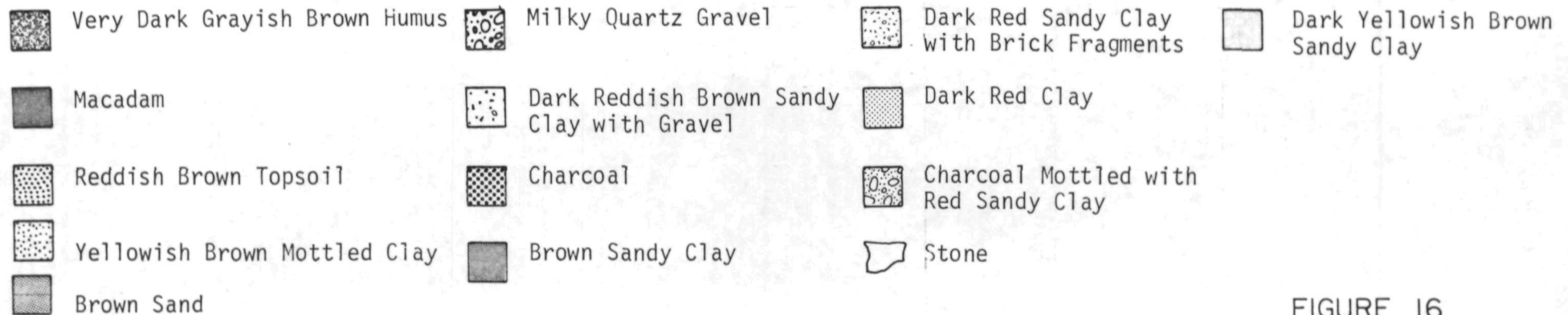


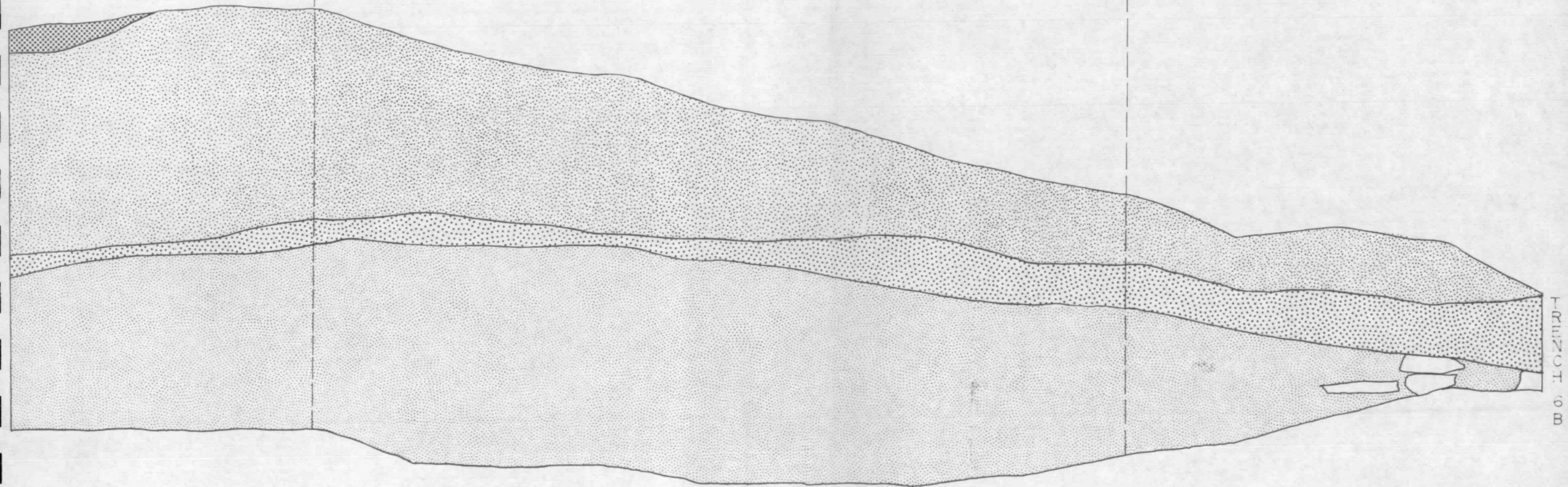
FIGURE 16

TRENCH 7 NORTHEAST OF TRENCH 6-B PROFILE






NORTH FACE

EAST FACE

SOUTHEAST FACE



LEGEND

- | | |
|---|---|
|  Charcoal |  Hard-packed Dark Red Clay |
|  Red Clay |  Stone |
|  Dark Reddish Brown Clay | |

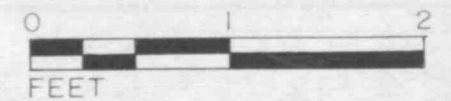
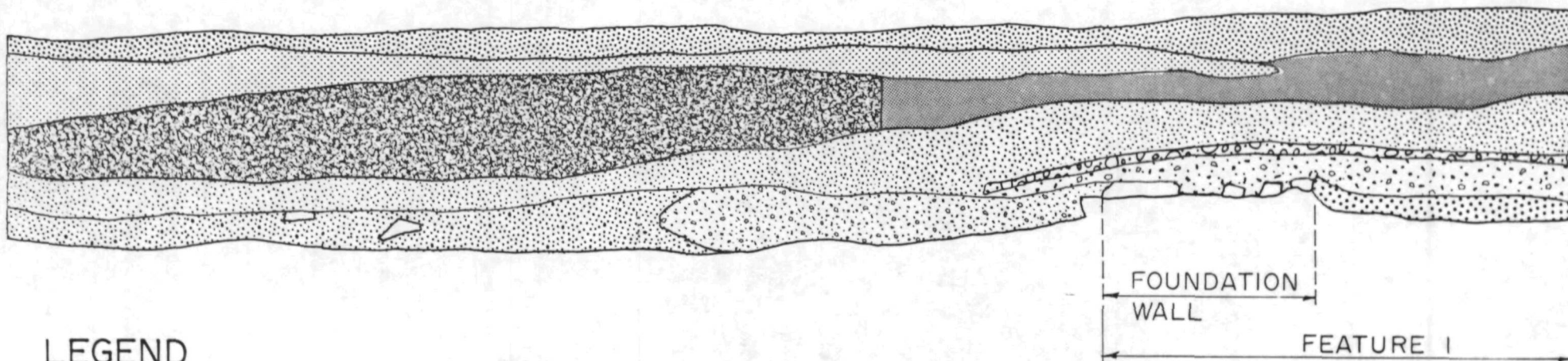













FIGURE 17

TRENCH 8 PROFILE SOUTH FACE

TRENCH 3



LEGEND

- | | | |
|---|--|---|
|  Reddish Brown Topsoil |  Milky Quartz Gravel |  Dark Yellowish Brown Sandy Clay |
|  Yellowish Brown Clay |  Reddish Brown Clay with Charcoal |  Dark Yellowish Brown Clay |
|  Dark Brown Sandy Humus |  Charcoal and Slag |  Stone |
|  Macadam |  Dark Reddish Brown Clay | |

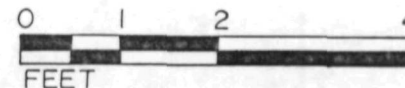
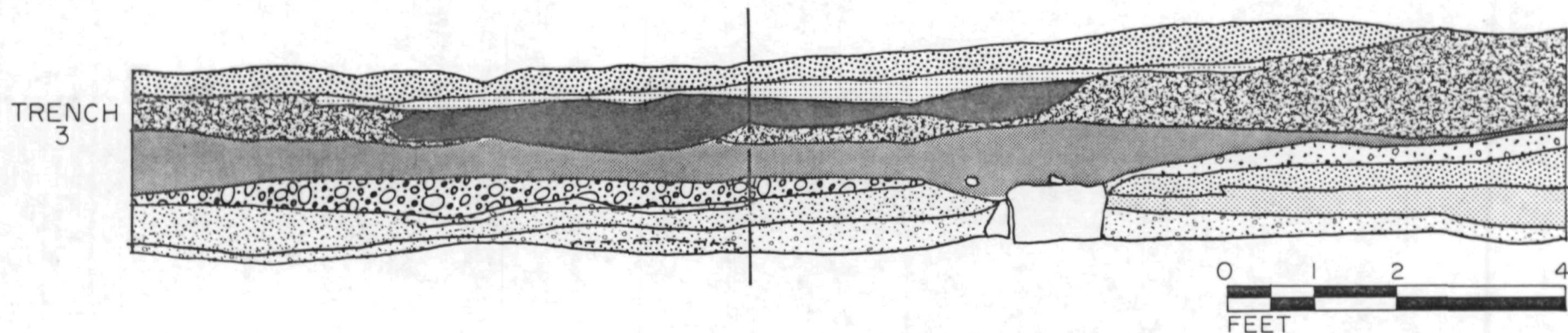


FIGURE 18

TRENCH 9 PROFILE WEST FACE



LEGEND

Reddish Brown Topsoil	Milky Quartz Gravel	Reddish Brown Clay with Charcoal
Dark Brown Sandy Humus	Dark Yellowish Brown Clay Mottled with Charcoal	Brownish Yellow Clay
Yellowish Brown Clay	Dark Reddish Brown Sandy Clay with Gravel	Dark Red Clay
Macadam	Charcoal and Slag	Stone
Dark Yellowish Brown Sandy Clay		

KEY PLAN

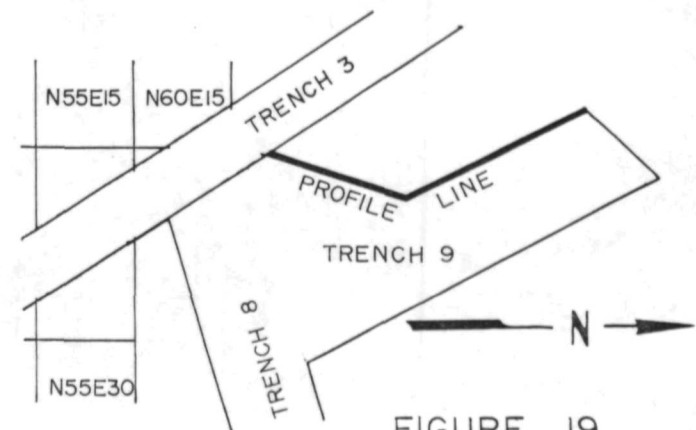


FIGURE 19

Plate 1. Site overview after initial clearing, prior
to excavation. Camera facing north.

Plate 2. Trench 1, south half, showing stone facing
and rip-rap construction of dam embankment.



Plate 3. Backhoe excavating Trench 2. Camera
facing northeast.

Plate 4. Overview of Trench 3 facing northwest.
Feature 1 stone foundation wall in foreground,
feature 4 stone foundation wall in background.



Plate 5. Screening artifacts. Trench 2 in background.

Plate 6. Feature 1 foundation wall in unit N55E30.
Camera facing west, scale is three feet.



Plate 7. Feature 1, south wall and auxiliary footings.
Camera facing southwest, scale is three feet.

Plate 8. Excavation of feature 1 western wall and interior.
Camera facing south.



Plate 9. Cross section of feature 8 in the balk's north face. Camera facing south, scale is three feet.

Plate 10. Unit N60W10, south half. Feature 8 is cutting across the unit's northwest corner, stone pocket is in the foreground. Camera facing west, scale is three feet.



Plate 11. Overview of northwestern site area, facing southwest. Feature 8 is visible in cross section in the balk's face, and to the right of the Auburn entrance pillar. The scale is on the portion of feature 8 with the larger "floor" stones and lacking the upright side stones. The stone wall of feature 4 is in the left foreground.

Plate 12. Overview of northern site area facing southwest. Stone wall of feature 9 in foreground, stone wall of feature 4 in center.



Plate 13. Cast iron wedge gate, a by-product of the flask-casting process. Flaring is visible along top edge. Slightly concave profile of bottom edge may indicate casting of hollow ware.

Plate 14. Cast iron sprues, by-products of the flask-casting technique. The example at left may be a riser (mold vent) due to the absence of flaring, while the center example might also be considered a very narrow wedge gate. The example at far right is a typical conical sprue.

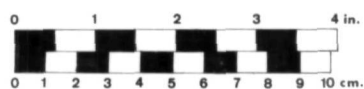
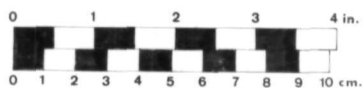


Plate 15. Small tripod pot (base) showing triangular legs and a straight handle similar to those illustrated in Plate 16. A small central scar suggests the use of a conical sprue in its manufacture. Not visible in the photo is a section of missing rim, suggesting that this pot represents a "waster."

Plate 16. Three triangular leg fragments and, at far right, one handle fragment, presumably representing pieces of defective pots or kettles, like that in Plate 15.

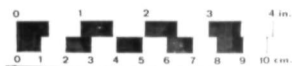


Plate 17. Three wrought iron artifact fragments, each tapering to a thin edge at bottom of photo. Thick ends may have been snapped. It is thought that these items may have served a chiseling or prying function.

Plate 18. Wrought iron hook with eye, found in square N65E0 in vicinity of Auburn gate pillars.

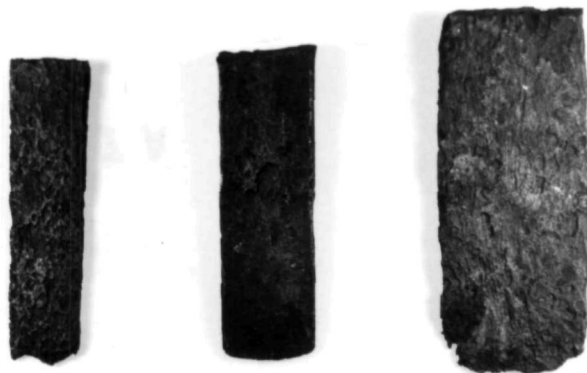


Plate 19. Pieces of frothy slag, somewhat tabular in shape,
showing impression of brick lining from furnace.



